



# **Okanogan County, Washington**

## **All Hazards Mitigation Plan**

### **Volume II**

## **Community Wildfire Protection Plan**

**December 13, 2006**

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***Vision:*** Promote a Countywide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Okanogan County.

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This plan was developed by the Okanogan County Community Wildfire Protection Plan Planning committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Dr., P.O. Box 9748, Moscow, ID, 83843, Tel: 208-883-4488, [www.Consulting-Foresters.com](http://www.Consulting-Foresters.com)

## Acknowledgments

This Community Wildfire Protection Plan represents the efforts and cooperation of a number of organizations and agencies; through the commitment of people working together to improve the preparedness for hazard events while reducing factors of risk.



Okanogan County Commissioners  
and the employees of Okanogan County



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**

Washington State Department of Natural Resources



USDI Bureau of Land  
Management



USDA Forest Service



USDI Bureau of  
Indian Affairs



USDI Fish & Wildlife  
Service



Confederated Tribes of the  
Colville Reservation



**FEMA**

Federal Emergency Management Agency



**EMD**

Washington Military Department  
Emergency Management Division

City of Omak  
City of Okanogan  
City of Oroville  
City of Tonasket  
City of Brewster  
City of Pateros



Okanogan C. D. C.

Town of Conconully  
Town of Nespelem  
Town of Elmer City  
Town of Coulee Dam  
Town of Riverside  
Town of Twisp  
Town of Winthrop



Okanogan County Fire Districts #1 - 16  
City of Omak Fire Department  
City of Okanogan Fire Department  
Town of Conconully Fire Department  
Town of Winthrop Fire Department



**American Red Cross**



Okanogan County Sheriff's Department  
Okanogan County Public Utilities District  
Okanogan Conservation District  
&

Local Businesses and Citizens of Okanogan County

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# Table of Contents

<b>CHAPTER I: OVERVIEW OF THIS PLAN AND ITS DEVELOPMENT .....</b>	<b>2</b>
<b>1 INTRODUCTION .....</b>	<b>2</b>
1.1 GOALS AND GUIDING PRINCIPLES.....	3
1.1.1 Federal Emergency Management Agency Philosophy .....	3
1.1.2 United States Government Accounting Office (GAO).....	4
1.1.2.1 Why GAO Did A Study .....	4
1.1.2.2 What GAO Found .....	4
1.1.3 Additional State and Federal Guidelines Adopted.....	5
1.1.3.1 National Fire Plan .....	5
1.1.3.2 Washington Statewide Implementation Strategy .....	7
1.1.3.2.1 County Wildland Fire Interagency Group.....	7
1.1.3.3 National Association of State Foresters .....	8
1.1.3.3.1 Identifying and Prioritizing Communities at Risk.....	8
1.1.3.3.2 Conceptual Approach.....	9
1.1.3.4 Healthy Forests Restoration Act .....	10
1.1.4 Planning Philosophy and Goals .....	11
1.1.4.1 Okanogan County Fire Mitigation Planning Effort and Philosophy .....	11
1.1.4.1.1 Mission Statement.....	11
1.1.4.1.2 Vision Statement.....	11
1.1.4.1.3 Goals .....	11
1.1.4.2 Integration with Other Local Planning Documents.....	12
1.1.4.2.1 Okanogan County Local Hazard Mitigation Plan – 2004 Draft .....	12
1.1.4.2.2 Okanogan County Comprehensive Plan.....	12
1.1.4.2.3 Okanogan County Hazard Identification and Vulnerability Assessment .....	13
1.1.4.2.4 Okanogan County Comprehensive Emergency Management Plan (CEMP).....	13
1.1.4.2.5 Okanogan County Zoning Ordinance.....	13
1.1.4.2.6 Critical Areas Ordinance.....	13
1.1.4.2.7 Open Space Timber/Open Space Open Space Plans .....	14
1.1.4.2.8 Master Program for Okanogan County Shoreline Management.....	14
1.1.4.2.9 Edelweiss Development Community Wildfire Protection Plan.....	14
1.1.4.2.10 Pine Forest Community Wildfire Protection Plan .....	14
1.1.4.2.11 Havillah Community Wildfire Protection Plan.....	15
1.1.4.2.12 Methow Community Wildfire Protection Plan .....	15
1.1.4.2.13 Open Space Timber/Open Space Open Space Plans .....	16
1.1.4.2.14 Master Program for Okanogan County Shoreline Management.....	16
<b>CHAPTER 2: DOCUMENTING THE PLANNING PROCESS .....</b>	<b>17</b>
<b>2 INITIATION.....</b>	<b>17</b>
2.1 DESCRIPTION OF THE PLANNING PROCESS .....	17
2.2 THE PLANNING TEAM .....	17
2.2.1 Multi-Jurisdictional Participation.....	18
2.3 PLANNING COMMITTEE MEETINGS .....	19
2.3.1.1 Committee Meeting Minutes.....	20
2.3.1.1.1 June 7 <sup>th</sup> , 2006 .....	20
2.3.1.1.2 July 26 <sup>th</sup> , 2006.....	23
2.3.1.1.3 August 30 <sup>th</sup> , 2006.....	25
2.3.1.1.4 September 28 <sup>th</sup> , 2006.....	26
2.3.1.1.5 October 26 <sup>th</sup> , 2006.....	28
2.4 PUBLIC INVOLVEMENT.....	29
2.4.1 News Releases.....	29
2.4.2 Public Mail Survey .....	30
2.4.2.1 Survey Results .....	31
2.4.3 Public Meetings .....	34
2.4.4 Documented Review Process.....	38
2.4.5 Continued Public Involvement.....	38

<b>CHAPTER 3: OKANOGAN COUNTY CHARACTERISTICS.....</b>	<b>40</b>
<b>3 BACKGROUND AND AREA DESCRIPTION.....</b>	<b>40</b>
3.1 DEMOGRAPHICS .....	40
3.2 SOCIOECONOMICS .....	41
3.2.1 <i>Description of Okanogan County</i> .....	44
3.2.1.1 Land Use.....	45
3.2.1.2 Resource Dependency.....	46
3.2.1.3 Recreation.....	46
3.2.1.3.1 Okanogan National Forest.....	47
3.2.1.3.2 State Parks.....	47
3.3 CULTURAL RESOURCES .....	47
3.3.1 <i>Colville Indian Reservation</i> .....	48
3.3.2 <i>National Register of Historic Places</i> .....	51
3.4 TRANSPORTATION & INFRASTRUCTURE.....	52
3.4.1 <i>Communication Sites and Lookouts</i> .....	53
3.5 VEGETATION & CLIMATE .....	55
3.5.1 <i>Monthly Climate Summaries in Okanogan County</i> .....	56
3.5.1.1 Coulee Dam .....	56
3.5.1.2 Methow, Washington .....	56
3.5.1.3 Omak, Washington .....	56
3.5.1.4 Tonasket, Washington.....	57
3.5.1.5 Mazama, Washington.....	57
3.6 ECOSYSTEMS .....	58
3.7 HYDROLOGY .....	58
3.8 AIR QUALITY .....	71
3.8.1 <i>Washington State Smoke Management Plan</i> .....	71
3.8.1.1 Background.....	71
3.8.1.2 Purpose .....	72
3.8.1.3 Goals.....	72
3.8.1.4 Scope.....	72
3.8.1.5 Participation.....	73
<b>CHAPTER 4: RISK AND PREPAREDNESS ASSESSMENTS.....</b>	<b>74</b>
<b>4 OVERVIEW.....</b>	<b>74</b>
4.1 WILDLAND FIRE CHARACTERISTICS .....	74
4.1.1 <i>Weather</i> .....	74
4.1.2 <i>Topography</i> .....	74
4.1.3 <i>Fuels</i> .....	75
4.2 WILDFIRE HAZARDS .....	75
4.2.1 <i>Wildfire Ignition Profile</i> .....	75
4.2.2 <i>Wildfire Extent Profile</i> .....	82
4.2.3 <i>Narrative of Past Wildfire Events in Okanogan County</i> .....	86
4.3 WILDFIRE HAZARD ASSESSMENT .....	87
4.3.1 <i>Fire Prone Landscapes</i> .....	87
4.3.2 <i>Historic Fire Regime</i> .....	91
4.3.2.1 General Limitations.....	91
4.3.3 <i>Fire Regime Condition Class</i> .....	92
4.4 OKANOGAN COUNTY CONDITIONS .....	94
4.5 OKANOGAN COUNTY’S WILDLAND-URBAN INTERFACE.....	95
4.5.1 <i>Potential WUI Treatments</i> .....	98
4.6 OKANOGAN COUNTY COMMUNITIES AT RISK .....	98
4.7 NEIGHBORHOODS IN OKANOGAN COUNTY .....	99
4.7.1 <i>Vegetative Associations</i> .....	100
4.7.2 <i>Overall Fuels Assessment</i> .....	101
4.7.3 <i>Overall Mitigation Activities</i> .....	102
4.7.4 <i>Okanogan River Valley</i> .....	103



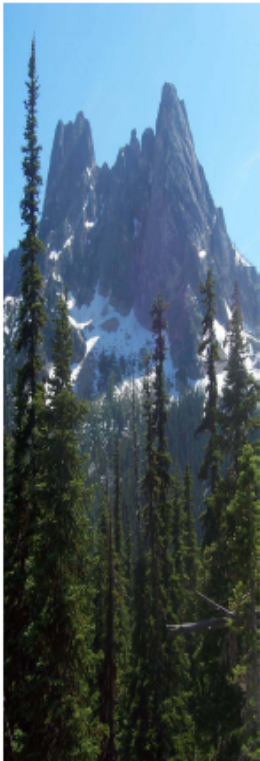
4.7.4.1	Neighborhoods of Oroville, Tonasket, Crumbacher, Omak-Okanogan, Malott, and Brewster .....	103
4.7.4.1.1	Fuels Assessment .....	104
4.7.4.1.2	Ingress-Egress .....	105
4.7.4.1.3	Infrastructure .....	105
4.7.4.1.4	Fire Protection .....	106
4.7.4.1.5	Community Assessment .....	107
4.7.4.1.6	Mitigation Activities .....	107
4.7.4.2	Neighborhoods of Similkameen, Loomis, Palmer, and Wannacut .....	108
4.7.4.2.1	Fuels Assessment .....	108
4.7.4.2.2	Ingress-Egress .....	109
4.7.4.2.3	Infrastructure .....	109
4.7.4.2.4	Fire Protection .....	109
4.7.4.2.5	Community Assessment .....	110
4.7.4.2.6	Mitigation Activities .....	111
4.7.4.3	Neighborhoods of Pine Creek, Happy Hill, Cook Mountain, and Conconully .....	111
4.7.4.3.1	Fuels Assessment .....	112
4.7.4.3.2	Ingress-Egress .....	113
4.7.4.3.3	Infrastructure .....	114
4.7.4.3.4	Fire Protection .....	114
4.7.4.3.5	Community Assessment .....	114
4.7.4.3.6	Mitigation Activities .....	115
4.7.4.4	Neighborhoods of Nine Mile and Mount Hull .....	116
4.7.4.4.1	Fuels Assessment .....	116
4.7.4.4.2	Ingress-Egress .....	116
4.7.4.4.3	Infrastructure .....	117
4.7.4.4.4	Fire Protection .....	117
4.7.4.4.5	Community Assessment .....	118
4.7.4.4.6	Mitigation Activities .....	118
4.7.4.5	Neighborhoods of Molson – Chesaw, Pontiac Ridge, and Havillah .....	118
4.7.4.5.1	Fuels Assessment .....	118
4.7.4.5.2	Ingress-Egress .....	119
4.7.4.5.3	Infrastructure .....	120
4.7.4.5.4	Fire Protection .....	120
4.7.4.5.5	Community Assessment .....	121
4.7.4.5.6	Mitigation Activities .....	122
4.7.4.6	Neighborhoods of Wauconda, Tunk – Chewiliken, and Aeneas Valley .....	122
4.7.4.6.1	Fuels Assessment .....	123
4.7.4.6.2	Ingress-Egress .....	124
4.7.4.6.3	Infrastructure .....	124
4.7.4.6.4	Fire Protection .....	125
4.7.4.6.5	Community Assessment .....	125
4.7.4.6.6	Mitigation Activities .....	127
4.7.4.7	Neighborhoods of Disautel and Timentwa .....	127
4.7.4.7.1	Fuels Assessment .....	127
4.7.4.7.2	Ingress-Egress .....	128
4.7.4.7.3	Infrastructure .....	128
4.7.4.7.4	Fire Protection .....	128
4.7.4.7.5	Community Assessment .....	129
4.7.4.7.6	Mitigation Activities .....	129
4.7.4.8	Neighborhoods of Nespelem and Coulee Dam .....	129
4.7.4.8.1	Fuels Assessment .....	130
4.7.4.8.2	Ingress-Egress .....	130
4.7.4.8.3	Infrastructure .....	130
4.7.4.8.4	Fire Protection .....	130
4.7.4.8.5	Community Assessment .....	131
4.7.4.8.6	Mitigation Activities .....	132
4.7.5	<i>Methow River Valley</i> .....	132
4.7.5.1	Neighborhoods of Winthrop, Twisp – Carlton, and Lower Methow .....	132
4.7.5.1.1	Fuels Assessment .....	132
4.7.5.1.2	Ingress-Egress .....	133
4.7.5.1.3	Infrastructure .....	134
4.7.5.1.4	Fire Protection .....	134

4.7.5.1.5	Community Assessment .....	135
4.7.5.1.6	Mitigation Activities .....	136
4.7.5.2	Neighborhoods of Twisp River, Wolf Creek, Mazama, and Chewuch .....	137
4.7.5.2.1	Fuels Assessment .....	137
4.7.5.2.2	Ingress-Egress .....	138
4.7.5.2.3	Infrastructure .....	139
4.7.5.2.4	Fire Protection .....	140
4.7.5.2.5	Community Assessment .....	140
4.7.5.2.6	Mitigation Activities .....	142
4.8	FIREFIGHTING RESOURCES AND CAPABILITIES .....	142
4.8.1	City of Okanogan Fire Department .....	143
4.8.2	City of Omak Volunteer Fire Department .....	145
4.8.3	Town of Conconully Fire Department .....	146
4.8.4	Town of Winthrop Volunteer Fire Department .....	147
4.8.5	Okanogan County Fire District #1 .....	148
4.8.6	Okanogan County Fire District #2 .....	149
4.8.7	Okanogan County Fire District #3 .....	150
4.8.8	Okanogan County Fire District #4 .....	152
4.8.9	Okanogan County Fire District #6 .....	153
4.8.10	Okanogan County Fire District #7 .....	155
4.8.11	Okanogan County Fire District #9 .....	156
4.8.12	Okanogan County Fire District #11 .....	157
4.8.13	Okanogan County Fire District #12 .....	161
4.8.14	Ferry/Okanogan County Fire Protection District #13 .....	163
4.8.15	Ferry/Okanogan County Fire Protection District #14 .....	168
4.8.16	Douglas/Okanogan County Fire District #15 .....	170
4.8.17	Okanogan County Fire District #16 .....	172
4.9	WILDLAND FIRE DISTRICTS .....	175
4.9.1	Washington Department of Natural Resources .....	175
4.9.1.1	South Okanogan District .....	175
4.9.1.2	Highlands District .....	178
4.9.2	Bureau of Land Management – Spokane District .....	181
4.9.3	USDA Forest Service – Okanogan and Wenatchee National Forests .....	181
4.10	ISSUES FACING OKANOGAN COUNTY FIRE PROTECTION .....	184
4.10.1	Wildland Fire Suppression Mobility .....	184
4.10.2	Accessibility .....	184
4.10.3	Recruitment and Retention, Funding, Equipment Needs, Etc .....	184
4.10.4	Road Signage and Rural Addressing .....	185
4.11	CURRENT WILDFIRE MITIGATION ACTIVITIES IN OKANOGAN COUNTY .....	185
4.11.1	North Central Washington Prescribed Fire Council .....	185
4.11.2	Havillah Community Wildfire Protection Plan .....	185
4.11.3	Fire Reporting .....	185
4.11.4	Pine Forest Community Wildfire Protection Plan .....	186
4.11.5	Burn Permitting .....	186
4.11.6	Methow Community Wildfire Protection Plan .....	187
4.11.7	Tunk Valley Grange Wildfire Committee .....	188
4.11.8	Edelweiss Community Wildfire Protection Plan .....	188
4.11.9	Multi-Jurisdictional Mutual Aid Agreements .....	188
<b>CHAPTER 5: TREATMENT RECOMMENDATIONS .....</b>		<b>189</b>
<b>5 ADMINISTRATION &amp; IMPLEMENTATION STRATEGY .....</b>		<b>189</b>
5.1	MONITORING AND MAINTENANCE .....	189
5.2	PRIORITIZATION OF MITIGATION ACTIVITIES .....	189
5.2.1	Prioritization Scheme .....	190
5.2.1.1	Benefit / Cost (BC) .....	191
5.2.1.2	Population Benefit .....	191
5.2.1.3	Property Benefit .....	192

5.2.1.4	Economic Benefit.....	192
5.2.1.5	Vulnerability of the Community .....	192
5.2.1.6	Project Feasibility (Environmentally, Politically & Socially) .....	192
5.2.1.7	Hazard Magnitude/Frequency .....	192
5.2.1.8	Potential for repetitive loss reduction.....	193
5.2.1.9	Potential to mitigate hazards to future development .....	193
5.2.1.10	Potential project effectiveness and sustainability .....	193
5.2.1.11	Final ranking .....	193
5.3	POSSIBLE WILDFIRE MITIGATION ACTIVITIES .....	193
5.4	SAFETY & POLICY .....	194
5.5	PEOPLE AND STRUCTURES .....	196
5.6	INFRASTRUCTURE .....	204
5.7	RESOURCE AND CAPABILITY ENHANCEMENTS .....	210
5.8	LOCAL COMMUNITY WILDFIRE PROTECTION PLAN MITIGATION ACTION PLANS.....	216
5.8.1	<i>Methow Mitigation Action Plan.....</i>	216
5.8.2	<i>Havillah Mitigation and Action Plan Recommendations.....</i>	219
5.8.3	<i>Pine Forest Community Mitigation Action Plan.....</i>	220
5.8.4	<i>Edelweiss Development Mitigation Action Plan.....</i>	225
5.9	REGIONAL LAND MANAGEMENT RECOMMENDATIONS .....	229
5.9.1	<i>Salvage Logging on Recently Burned Areas in the Wildland Urban Interface.....</i>	229
5.9.2	<i>Prescribed Fire Use in the Wildland Urban Interface.....</i>	230
5.10	AGENCY PROJECTS: CURRENT, PLANNED, PROPOSED, OR ON-GOING .....	230
5.10.1	<i>Washington Department of Natural Resources .....</i>	230
5.10.1.1	Palmer View T.S. Area .....	231
5.10.1.2	Bonaparte Lake Resort and Campground.....	231
5.10.1.3	North Bonaparte T.S. Area.....	231
5.10.1.4	Pontiac Trap T.S. Area.....	231
5.10.1.5	Bannon T.S. Area.....	231
5.10.1.6	Turner Creek T.S. Area.....	231
5.10.1.7	Bonaparte Meadows T.S. Area .....	232
5.10.2	<i>USDA Forest Service Projects .....</i>	232
<b>CHAPTER 6: SUPPORTING INFORMATION.....</b>		<b>235</b>
<b>6.....</b>		<b>235</b>
6.1	LIST OF TABLES .....	235
6.2	LIST OF FIGURES .....	238
6.3	LIST OF PREPARERS .....	238
6.4	SIGNATURE PAGES.....	239
6.4.1	<i>Local Government .....</i>	239
6.4.2	<i>Signatures of Participation by Okanogan County Fire Districts and Departments .....</i>	241
6.4.3	<i>Signatures of Participation by other Okanogan County Entities.....</i>	243
6.5	GLOSSARY OF TERMS .....	244
6.6	LITERATURE CITED .....	251

## Foreword

The **Okanogan County All Hazards Mitigation Plan** was developed during 2006 by the Okanogan County Hazard Mitigation Planning Committee in cooperation with Northwest Management, Inc., of Moscow, Idaho. The Okanogan County Community Wildfire Protection Plan (Volume II) is part of the Okanogan County All Hazards Mitigation Plan (Volume I). Although it is being published as a separate document, it should be considered one chapter of the All Hazards Mitigation Plan and is hereby incorporated into that plan's contents. The All Hazards Mitigation Plan Appendices; Volume III, includes many maps and related information for both Volumes I and II.



**Okanogan County,  
Washington**


**All Hazards  
Mitigation Plan Update**

**Flood Mitigation Plan  
Landslide Mitigation Plan  
Earthquake Mitigation Plan  
Severe Weather**

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*Vision: Promote a countywide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Okanogan County.*

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**Volume I**

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This plan was developed by the Ferry County All Hazards Mitigation Plan Committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Dr., P.O. Box 9748, Moscow, ID, 83843, Tel: 208-883-4488, [www.Consulting-Foresters.com](http://www.Consulting-Foresters.com)


**Okanogan County, Washington**

**Community Wildfire Protection Plan  
Appendices**

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Okanogan County All Hazard Mitigation Plan Vision Statement: Promote a countywide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Okanogan County.

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**Volume III**

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This plan was developed by the Okanogan County All Hazard Mitigation Planning committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Dr., P.O. Box 9748, Moscow, ID, 83843, Tel: 208-883-4488, [www.Consulting-Foresters.com](http://www.Consulting-Foresters.com)

## **Chapter I: Overview of this Plan and its Development**

### **1 Introduction**

This Community Wildfire Protection Plan (CWPP) for Okanogan County, Washington, is the result of analyses, professional cooperation and collaboration, assessments of wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, infrastructure, and unique ecosystems in Okanogan County, Washington. The planning committee responsible for implementing this project was led by the Okanogan County Commissioners. Agencies and organizations that participated in the planning process included:

- Okanogan County Commissioners and County Departments
- City of Omak
- City of Okanogan
- City of Oroville
- City of Tonasket
- City of Brewster
- City of Pateros
- Town of Conconully
- Town of Nespelem
- Town of Elmer City
- Town of Coulee Dam
- Town of Riverside
- Town of Twisp
- Town of Winthrop
- Okanogan County Fire Districts
- City of Omak Fire Department
- City of Okanogan Fire Department
- Town of Conconully Fire Department
- Town of Winthrop Fire Department
- Washington Department of Natural Resources
- Confederated Tribes of the Colville Reservation
- Colville Agency, Bureau of Indian Affairs
- Washington Department of Fish and Wildlife
- Okanogan County Public Utilities District
- Highlands Fire Defense Team
- Okanogan County Public Health
- USDI Bureau of Land Management
- Okanogan Communities Development Council
- Washington Military Department, Emergency Management Division
- Okanogan County Conservation District

- USDA Forest Service
- Okanogan County Sheriff's Department and Emergency Management
- Red Cross
- Northwest Management, Inc.

The Okanogan County planning committee met regularly in early 2006 to establish the committee structure, goals, and strategies. In April and May of 2006, Okanogan County solicited competitive bids from companies to provide the service of leading the assessment, developing the data, and writing the **Okanogan County Community Wildfire Protection Plan** and **All Hazard Mitigation Plan**. Northwest Management, Inc. was selected to provide this service to the County. Northwest Management, Inc. (NMI) is a professional natural resources consulting firm located in Moscow, Idaho. Established in 1984 NMI provides natural resource management services across the USA. The Project Co-Managers from Northwest Management, Inc. were Dr. William E. Schlosser, Mr. Vaiden Bloch, and Mrs. Tera R. King.

## **1.1 Goals and Guiding Principles**

### **1.1.1 Federal Emergency Management Agency Philosophy**

Effective November 1, 2004, an All Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM program provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local All Hazard Mitigation Plan requirements for HMGP and PDM eligibility is based on the Disaster Mitigation Act (DMA) of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local All Hazard Mitigation Plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA will only review a local All Hazard Mitigation Plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local All Hazard Mitigation Plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption.

This Community Wildfire Protection Plan will be added as a chapter to the Okanogan County All Hazard Mitigation Plan.

In Washington the SHMO is:

Martin E. Best  
Washington Military Department  
Emergency Management Division  
Building 20, M/S: TA-20  
Camp Murray, WA 98430-5122

A FEMA designed plan will be evaluated on its adherence to a variety of criteria.

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process

- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation Through Existing Programs
- Continued Public Involvement

## **1.1.2 United States Government Accounting Office (GAO)**

Technology Assessment - April 2005 – “Protecting Structures and Improving Communications during Wildland Fires”.

### **1.1.2.1 Why GAO Did A Study**

Since 1984, wildland fires have burned an average of more than 850 homes each year in the United States and, because more people are moving into fire-prone areas bordering wildlands, the number of homes at risk is likely to grow. The primary responsibility for ensuring that preventative steps are taken to protect homes lies with homeowners and state and local governments, not the federal government. Although losses from wildland fires made up only 2 percent of all insured catastrophic losses from 1983 to 2002, fires can result in billions of dollars in damages.

Once a wildland fire starts, various parties can be mobilized to fight it including federal, state, local, and tribal firefighting agencies and, in some cases, the military. The ability to communicate among all parties - known as interoperability - is essential but, as GAO reported previously, is hampered because different public safety agencies operate on different radio frequencies or use incompatible communications equipment (GAO 2005).

GAO was asked to assess, among other issues, (1) measures that can help protect structures from wildland fires, (2) factors affecting use of protective measures, and (3) the role technology plays in improving firefighting agencies' ability to communicate during wildland fires.

### **1.1.2.2 What GAO Found**

The two most effective measures for protecting structures from wildland fires are: (1) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where vegetation and other flammable objects are reduced or eliminated; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows and building materials, chemical agents, sprinklers, and geographic information systems mapping – can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for



fire protection. Federal, state, and local governments, as well as other organizations, are attempting to increase property owners' use of protective measures through education, direct monetary assistance, and laws requiring such measures. In addition, some insurance companies have begun to direct property owners in high risk areas to take protective steps.

Existing technologies, such as audio switches, can help link incompatible communication systems, and new technologies, such as software-defined radios, are being developed following common standards or with enhanced capabilities to overcome incompatibility barriers. Technology alone, however, cannot solve communications problems for those responding to wildland fires. Rather, planning and coordination among federal, state, and local public safety agencies is needed to resolve issues such as which technologies to adopt, cost sharing, operating procedures, training, and maintenance. The Department of Homeland Security is leading federal efforts to improve communications interoperability across all levels of government. In addition to federal efforts, several states and local jurisdictions are pursuing initiatives to improve communications interoperability.

### **1.1.3 Additional State and Federal Guidelines Adopted**

This Community Wildfire Protection Plan will include compatibility with FEMA requirements for an All Hazard Mitigation Plan, while also adhering to the guidelines proposed in the National Fire Plan, the Washington Statewide Implementation Plan, and the Healthy Forests Restoration Act (2004). This Community Wildfire Protection Plan has been prepared in compliance with:

- The National Fire Plan; A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan–May 2002.
- The Washington Statewide Implementation Strategy for the National Fire Plan–July 2002.
- Healthy Forests Restoration Act (2004)
- The Federal Emergency Management Agency's Region 10 guidelines for a Local All Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Natural Hazards Mitigation Plan.

***“When implemented, the 10-Year Comprehensive Strategy will contribute to reducing the risks of wildfire to communities and the environment by building collaboration at all levels of government.”***

***- The NFP 10-Year Comprehensive Strategy August 2001***

The objective of combining these four complimentary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Okanogan County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

#### **1.1.3.1 National Fire Plan**

The goals of this Community Wildfire Protection Plan include:

1. Improve Fire Prevention and Suppression
2. Reduce Hazardous Fuels

3. Restore Fire-Adapted Ecosystems
4. Promote Community Assistance

Its three guiding principles are:

1. Priority setting that emphasizes the protection of communities and important watersheds at-risk.
2. Collaboration among governments and broadly representative stakeholders
3. Accountability through performance measures and monitoring for results.

This Community Wildfire Protection Plan fulfills the National Fire Plan's 10-Year Comprehensive Strategy and the Washington Statewide Implementation Strategy for the National Fire Plan. The projects and activities recommended under this plan are in addition to other Federal, state, and private / corporate forest and rangeland management activities. The implementation plan does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of participating Federal, State, and tribal agencies.

By endorsing this implementation plan, all signed parties agree that reducing the threat of wildland fire to people, communities, and ecosystems will require:

- Firefighter and public safety continuing as the highest priority.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.
- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

The National Fire Plan identifies a three-tiered organization structure including 1) the local level, 2) state/regional and tribal level, and 3) the national level. This plan adheres to the collaboration and outcomes consistent with a local level plan. Local level collaboration involves participants with direct responsibility for management decisions affecting public and/or private land and resources, fire protection responsibilities, or good working knowledge and interest in local resources. Participants in this planning process include Tribal representatives, local representatives from Federal and State agencies, local governments, landowners and other stakeholders, and community-based groups with a demonstrated commitment to achieving the strategy's four goals. Existing resource advisory committees, watershed councils, or other collaborative entities may serve to achieve coordination at this level. Local involvement, expected to be broadly representative, is a primary source of planning, project prioritization, and

resource allocation and coordination at the local level. The role of the private citizen is not to be underestimated, as their input and contribution to all phases of risk assessments, mitigation activities, and project implementation is greatly facilitated by their involvement.

### **1.1.3.2 Washington Statewide Implementation Strategy**

The Strategy adopted by the State of Washington is to provide a framework for an organized and coordinated approach to the implementation of the National Fire Plan, specifically the national “10-Year Comprehensive Strategy Implementation Plan”.

Emphasis is on a collaborative approach at the following levels:

- County
- State

Within the State of Washington, the counties, with the assistance of State and Federal agencies and local expert advice, will develop a risk assessment and mitigation plan to identify local vulnerabilities to wildland fire. A Statewide group will provide oversight and prioritization as needed on a statewide scale.

This strategy is not intended to circumvent any work done to date and individual counties should not delay implementing any National Fire Plan projects to develop this county plan. Rather, counties are encouraged to identify priority needs quickly and begin whatever actions necessary to mitigate those vulnerabilities.

It is recognized that implementation activities such as; hazardous fuel treatment, equipment purchases, training, home owner education, community wildland fire mitigation planning, and other activities, will be occurring concurrently with this countywide planning effort.

#### **1.1.3.2.1 County Wildland Fire Interagency Group**

Each county within the State has been requested to write a Wildland Fire Mitigation Plan. These plans should contain at least the following five elements:

- 1) Documentation of the process used to develop the mitigation plan. How the plan was developed, who was involved and how the public was involved.
- 2) A risk assessment to identify vulnerabilities to wildfire in the wildland-urban interface (WUI).
- 3) A prioritized mitigation strategy that addresses each of the risks. Examples of these strategies could be: training for fire departments, public education, hazardous fuel treatments, equipment, communications, additional planning, new facilities, infrastructure improvements, code and/or ordinance revision, volunteer efforts, evacuation plans, etc.
- 4) A process for maintenance of the plan which will include monitoring and evaluation of mitigation activities
- 5) Documentation that the plan has been formally adopted by the involved agencies. Basically a signature page of all involved officials.

This five-element plan is an abbreviated version of the FEMA mitigation plan and will begin to meet the requirements for that plan. To develop these plans each county should bring together the following individuals, as appropriate for each county, to make up the County Wildland Fire Interagency Group (Planning committee). It is important that this group has representation from agencies with wildland fire suppression responsibilities:

- County Commissioners (Lead)

- Local Fire Chiefs
- Washington Department of Natural Resources representative
- USDA Forest Service representative
- USDI Bureau of Land Management representative
- US Fish and Wildlife representative
- Bureau of Indian Affairs
- Local Tribal leaders
- Washington Military Department, Emergency Management Division
- Local Emergency Planning Committee (LEPC) Chairperson
- Resource Conservation and Development representative
- Washington Department of Wildlife representative
- Interested citizens and community leaders as appropriate
- Other officials as appropriate

Role of Resource Conservation and Development Councils (RC&D): If requested by the County Commissioners, the local RC&D's may be available to assist the County Commissioners in evaluating each county within their council area to determine if there is a wildland fire mitigation plan in place, or if a plan is currently in the development phase. If no plan is in place, the RC&D's, if requested, could be available to assist the Commissioners with the formation of the County Wildland Fire Interagency Group and/or to facilitate the development of wildland fire mitigation plan.

If a plan has been previously completed, the Commissioners will determine if the recommended five elements have been addressed. The counties will provide a copy of the completed mitigation plan to the Washington Department of Natural Resources National Fire Plan Coordinator, which will include a contact list of individuals that developed the plan.

### **1.1.3.3 National Association of State Foresters**

#### **1.1.3.3.1 Identifying and Prioritizing Communities at Risk**

This plan is written with the intent to provide the information necessary for decision makers (elected officials) to make informed decisions in order to prioritize projects across the entire county. These decisions may be made from within the council of Commissioners, or through the recommendations of ad hoc groups tasked with making prioritized lists of projects. It is not necessary to rank projects numerically, although that is one approach, rather it may be possible to rank them categorically (high priority set, medium priority set, and so forth) and still accomplish the goals and objectives set forth in this planning document.

The following was prepared by the National Association of State Foresters (NASF), June 27, 2003, and is included here as a reference for the identification of prioritizing treatments between communities.

**Purpose:** To provide national, uniform guidance for implementing the provisions of the "Collaborative Fuels Treatment" MOU, and to satisfy the requirements of Task e, Goal 4 of the Implementation Plan for the 10-Year Comprehensive Strategy.

**Intent:** The intent is to establish broad, nationally compatible standards for identifying and prioritizing communities at risk, while allowing for maximum flexibility at the state and regional level. Three basic premises are:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities by evaluating projects, not by ranking communities.

The National Association of State Foresters (NASF) set forth the following guidelines in the Final Draft Concept Paper; Communities at Risk, December 2, 2002.

**Task:** Develop a definition for “communities at risk” and a process for prioritizing them, per the Implementation Plan for the 10-Year Comprehensive Strategy (Goal 4.e.). In addition, this definition will form the foundation for the NASF commitment to annually identify priority fuels reduction and ecosystem restoration projects in the proposed MOU with the federal agencies (section C.2 (b)).

#### **1.1.3.3.2 Conceptual Approach**

1. NASF fully supports the definition of the Wildland Urban Interface (WUI) previously published in the Federal Register. Further, proximity to federal lands should not be a consideration. The WUI is a set of conditions that exists on, or near, areas of wildland fuels nation-wide, regardless of land ownership.
2. Communities at risk (or, alternately, landscapes of similar risk) should be identified on a state-by-state basis with the involvement of all agencies with wildland fire protection responsibilities: state, local, tribal, and federal.
3. It is neither reasonable nor feasible to attempt to prioritize communities on a rank order basis. Rather, communities (or landscapes) should be sorted into three, broad categories or zones of risk: high, medium, and low. Each state, in collaboration with its local partners, will develop the specific criteria it will use to sort communities or landscapes into the three categories. NASF recommends using the publication “Wildland/Urban Interface Fire Hazard Assessment Methodology” developed by the National Wildland/Urban Interface Fire Protection Program (circa 1998) as a reference guide. (This program, which has since evolved into the Firewise Program, is under the oversight of the National Wildfire Coordinating Group (NWCG)). At minimum, states should consider the following factors when assessing the relative degree of exposure each community (landscape) faces.
  - **Risk:** Using historic fire occurrence records and other factors, assess the anticipated probability of a wildfire ignition.
  - **Hazard:** Assess the fuel conditions surrounding the community using a methodology such as fire condition class, or [other] process.
  - **Values Protected:** Evaluate the human values associated with the community or landscape, such as homes, businesses, and community infrastructure (e.g. water systems, utilities, transportation systems, critical care facilities, schools, manufacturing and industrial sites, and high value commercial timber lands).
  - **Protection Capabilities:** Assess the wildland fire protection capabilities of the agencies and local fire departments with jurisdiction.

4. Prioritize by project not by community. Annually prioritize projects within each state using the collaborative process defined in the national, interagency MOU “For the Development of a Collaborative Fuels Treatment Program”. Assign the highest priorities to projects that will provide the greatest benefits either on the landscape or to communities. Attempt to properly sequence treatments on the landscape by working first around and within communities, and then moving further out into the surrounding landscape. This will require:
  - First, focus on the zone of highest overall risk but consider projects in all zones. Identify a set of projects that will effectively reduce the level of risk to communities within the zone.
  - Second, determining the community’s willingness and readiness to actively participate in an identified project.
  - Third, determining the willingness and ability of the owner of the surrounding land to undertake, and maintain, a complementary project.
  - Last, set priorities by looking for projects that best meet the three criteria above. It is important to note that projects with the greatest potential to reduce risk to communities and the landscape may not be those in the highest risk zone, particularly if either the community or the surrounding landowner is not willing or able to actively participate.
5. It is important, and necessary, that we be able to demonstrate a level of accomplishment that justifies to Congress the value of continuing the current level of appropriations for the National Fire Plan. Although appealing to appropriators and others, it is not likely that many communities (if any) will ever be removed from the list of communities at risk. Even after treatment, all communities will remain at some, albeit reduced, level of risk. However, by using a science-based system for measuring relative risk, we can likely show that, after treatment (or a series of treatments); communities are at “*reduced risk*”.

Similarly, scattered, individual homes that complete projects to create defensible space could be “counted” as “households at reduced risk”. This would be a way to report progress in reducing risk to scattered homes in areas of low priority for large-scale fuels treatment projects.

Using the concept described above, the NASF believes it is possible to accurately assess the relative risk that communities face from wildland fire. Recognizing that the condition of the vegetation (fuel) on the landscape is dynamic, assessments and re-assessments must be done on a state-by-state basis, using a process that allows for the integration of local knowledge, conditions, and circumstances, with science-based national guidelines. We must remember that it is not only important to lower the risk to communities, but once the risk has been reduced, to maintain those communities at a reduced risk.

Further, it is essential that both the assessment process and the prioritization of projects be done collaboratively, with all local agencies with fire protection jurisdiction – federal, state, local, and tribal – taking an active role.

#### **1.1.3.4 Healthy Forests Restoration Act**

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for

America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

Among other things the Healthy Forests Restoration Act (HFRA):

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

The Okanogan County Community Wildfire Protection Plan is developed to adhere to the principles of the HFRA while providing recommendations consistent with the policy document which should assist the federal land management agencies (US Forest Service and Bureau of Land Management) with implementing wildfire mitigation projects in Okanogan County that incorporate public involvement and the input from a wide spectrum of fire and emergency services providers in the region.

## **1.1.4 Planning Philosophy and Goals**

### **1.1.4.1 Okanogan County Fire Mitigation Planning Effort and Philosophy**

The goals of this planning process include the integration of the National Fire Plan, the Washington Statewide Implementation Strategy, the Healthy Forests Restoration Act, and the requirements of FEMA for a wildfire plan chapter, a component of the County's All Hazard Mitigation Plan. This effort will utilize the best and most appropriate science from all partners, the integration of local and regional knowledge about wildfire risks and fire behavior, while meeting the needs of local citizens, the regional economy, and the significance of this region to the rest of Washington and the Inland West.

#### **1.1.4.1.1 Mission Statement**

The Okanogan County Community Wildfire Protection Plan identifies wildfire response capability, educates homeowners to reduce the ignitability of structures, evaluates critical infrastructure throughout the County, identifies prioritized areas for hazardous fuel reduction treatments on Federal, State, and Private land, and to builds on existing efforts to restore healthy forest conditions within the County. This plan will clarify our priorities for the protection of life, property, and critical infrastructure as well as identify wildland-urban interface areas.

#### **1.1.4.1.2 Vision Statement**

Promote a Countywide wildfire hazard mitigation concept through leadership, professionalism, and excellence, guiding the way to a safe, sustainable Okanogan County.

#### **1.1.4.1.3 Goals**

- To reduce the area of WUI land burned and losses experienced because of wildfires
- Prioritize the protection of people, structures, infrastructure, and unique ecosystems contributing to our way of life and the sustainability of the local and regional economy



- Educate communities about the unique challenges of wildfire in the wildland-urban interface (WUI)
- Establish mitigation priorities and develop mitigation strategies in Okanogan County
- Strategically locate and plan fuel reduction projects
- Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash
- Meet or exceed the requirements of the National Fire Plan and FEMA for a County-level Wildfire Protection Plan

#### **1.1.4.2 Integration with Other Local Planning Documents**

During the development of this Community Wildfire Protection Plan several planning and management documents were reviewed in order to avoid conflicting goals and objectives. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the mitigation objectives outlined in this document. The following narratives help identify and briefly describe some of the existing Okanogan County planning documents and ordinances considered during the development of this plan.

##### **1.1.4.2.1 Okanogan County Local Hazard Mitigation Plan – 2004 Draft**

In the 2004 Draft of the Local Hazard Mitigation Plan, the Task Force was developing ways to raise the community awareness of the natural hazards that threaten the public health and safety, the economic vitality of businesses, and the operational capability of important facilities and institutions. The draft plan identified the hazards threatening Okanogan County and provided an assessment of the risks posed. It also detailed the specific vulnerabilities of Okanogan County and many of the facilities that are important to the community's daily life. The plan included proposals to avoid or minimize those vulnerabilities. This information assisted individuals in understanding how the community could become safer from the impacts of future disasters. The work done and community supported garnered during the 2004 planning process has been incorporated in this All Hazard Mitigation Plan.

##### **1.1.4.2.2 Okanogan County Comprehensive Plan**

The Okanogan County Comprehensive Plan (Plan) is a 20-year guide for the future of Okanogan County. The Plan provides a framework to support growth, development, and public decision-making in the County. It provides the vision of how residents want the County to grow and evolve over time. It establishes the goals, policies, priorities, and actions that the County will pursue to allow maintenance and enhancement of the quality of life, preservation of the rural character, sustainability of agricultural and natural resource industries, provision of recreational opportunities for residents and visitors, and protection of environmentally sensitive areas.

A comprehensive plan is a document that can benefit private property owners, local businesses, County staff, cities and towns in the County, state and federal agencies, Tribes, community organizations and other interested parties. It is an effective management tool for elected officials, empowers community members to help define the future vision and character of the County, guide development patterns of the County, and provide predictability to property owners regarding the future use and enjoyment of their land.

Updates of the Okanogan County Comprehensive Plan will support the Okanogan County All Hazard Mitigation Plan and Community Wildfire Protection Plan as these documents support the initiatives in the Comprehensive Plan.

#### **1.1.4.2.3 Okanogan County Hazard Identification and Vulnerability Assessment**

The Hazard Identification and Vulnerability Assessment (HIVA) dated February 2004 describes natural and technological (human-made) hazards, which can potentially impact the people, economy, environment, and property of Okanogan County. It serves as a basis for County-level emergency management programs. It is the foundation of effective emergency management and identifies the hazards that organizations must mitigate against, prepare for, respond to, and recover from in order to minimize the effects of disasters and emergencies. The HIVA is not a detailed study, but rather a general overview of hazards that can cause emergencies and disasters. The Okanogan County All Hazards Mitigation Plan is a much more comprehensive approach, is more detailed, and provides specific plans to approach the County's problem areas.

#### **1.1.4.2.4 Okanogan County Comprehensive Emergency Management Plan (CEMP)**

The Comprehensive Emergency Management Plan (CEMP) dated November 2003 considers the emergencies and disasters likely to occur, as described in the Okanogan County Hazard Identification and Vulnerability Assessment, and describes functions and activities necessary to implement the four phases of Emergency Management – mitigation, preparedness, response and recovery. The plan utilizes Emergency Support Functions, which identify primary and support agencies responsibilities/activities that County and local jurisdictions may need in order to implement all-hazard mitigation. It provides policies, information, recommendations and guidance to assist responsible officials making operational decisions. This plan is more the “who, what, when, where and why” activities in the event of an emergency. Emergency Support Functions (ESFs) = Transportation; Emergency Communications; Public Works & Engineering; Fire Protection; Information Analysis & Planning; Mass Care; Resource Management; Health & Medical Services; Search & Rescue; Hazardous Materials; Food & Water; Energy & Utilities; Military Support; Recovery & Restoration; Law Enforcement; and Damage Assessment. This plan does not conflict in any way with the All Hazards Mitigation Plan. CEMP updates will include support of initiatives and action items outlined in the Okanogan County All Hazards Mitigation Plan.

#### **1.1.4.2.5 Okanogan County Zoning Ordinance**

This ordinance does not identify hazard areas in great detail although there are a few zoning districts in the Methow Valley that prohibit new residences within the floodplain. These zones are the “Methow Review District”, the “Rural Residential District”, and the “Low Density Residential District”.

#### **1.1.4.2.6 Critical Areas Ordinance**

This ordinance identifies protected and hazardous areas. Protected areas are fish and wildlife habitat conservation areas, aquifer recharge areas, and wetlands. Hazardous areas are frequently flooded areas, geologically hazardous areas, erosion hazard areas, landslide hazard areas, mine hazard areas, seismic hazard areas, and volcanic hazard areas.

#### **1.1.4.2.7 Open Space Timber/Open Space Open Space Plans**

The Open Space Timber (OST) and Open Space Open Space (OSOS) Plans could be affected by some fuel reduction practices. The effects are more beneficial than hazardous, if handled appropriately. OST requires the sustenance of healthy commercial-grade timber. Fuels reduction has been shown to increase timber health. OSOS requires the sustenance of priority resources, other than timber. Landowners must ensure that fire-safety practices do not damage priority resources that keep them in the program in which they receive a property tax reduction.

#### **1.1.4.2.8 Master Program for Okanogan County Shoreline Management**

The Master Program for Shoreline Management outlines allowed/prohibited uses within specific shoreline zoning designations. All shoreline designations allow forest practices within shoreline areas. Non-forestry related mitigation actions would be looked at individually, hopefully either allowed or allowed by permit. Most of the identified action items would have no effect on the shoreline areas such as road signs, evacuation plan, public education, fire-safe building materials etc. The shoreline ordinance is currently being revised and will conform to all existing regulations and plans. Upon approval of the Okanogan County All Hazard Mitigation and Community Wildfire Protection Plans, the revised shoreline plan will acknowledge and support their adoption.

#### **1.1.4.2.9 Edelweiss Development Community Wildfire Protection Plan**

Citizens in the Edelweiss Development of Okanogan County have been concerned about the effects of wildfire since development began in the early 1970's. The community was placed on a Level II Evacuation Order during the Whiteface Fire in 1994. The 2004 Fawn Peak Fire and recent major fires in the Pasayten Wilderness and in the Chewuch Drainage keep this concern alive. The 2003 Needles Fire, that threatened the entire upper Methow Valley, provided another scare, evacuation alert and increased emphasis for fire safety. The Edelweiss Maintenance Commission (EMC), the association management body, took action in 2001 and applied for a National Fire Plan grant. They were successful in acquiring a \$145,700 grant to conduct a "Fire Wise" workshop and risk assessments, to develop a Community Wildfire Protection Plan, to develop a fuel break along the Goat Creek Road and begin fuels treatment on demonstration lots and on the first bench. In 2002 the grant was amended to add \$300,050 to continue additional fuels treatments. These funds have provided for increased awareness and support for the program and fuels treatment on 134 high priority acres, on about 25% of the development. But blocks of high-risk fuels still exist and the community desires to continue the program. Proposed projects are outlined in this Community Wildfire Protection Plan (CWPP).

The primary goal of the Edelweiss Community Wildfire Protection Plan (CWPP) is to identify and implement projects that will protect people in the CWPP area, including residents, firefighters, and emergency personnel, from injury and loss of life. The secondary goal is to minimize or eliminate damage or loss of property and essential infrastructure due to wildfire.

#### **1.1.4.2.10 Pine Forest Community Wildfire Protection Plan**

Citizens in the Pine Forest Development of Okanogan County [Methow Valley near Winthrop] have been concerned about the effects of wildfire since they began development in the early 1970's. This concern was amplified in 1995 when the Fire District, Department of Natural Resources and Forest Service conducted a fire simulation exercise that showed lives and the entire community would be lost during the simulated fire. Increased awareness and recent

frequent fires in the Methow Valley provide the catalyst for reducing the fire risk. Pine Forest was the first community to address the fire risk conditions in the Methow Valley.

The Pine Forest Owners Association (PFOA), the association management body, took action in 1998 to develop a Forest Stewardship Plan to address the fuels loading and forest health conditions, starting with the community greenbelt areas. Initial treatments were commercial thinning, removing ladder fuels and hand piling and burning.

This was followed by three National Fire Program grants, totaling nearly \$100,000, in 2001 and 2002 to continue the program. These funds provided for increased awareness and support for the program and fuels treatment on about 150 high priority acres, about 30% of the development. Current grants will complete the risk assessments, complete development of their local CWPP, and treat an additional 70 acres. Blocks of high-risk fuels will remain in the Pine Forest area; thus, the community desires to continue the program. Lack of safe ingress/egress continues to be a major concern.

#### **1.1.4.2.11 Havillah Community Wildfire Protection Plan**

The Havillah community is an unincorporated area in the northeast corner of Okanogan County. There are no Rural Fire Districts within the area covered by the Havillah CWPP. The area has a history of large wildfires which have burned numerous residences and structures in the vicinity, destroyed private and public timber stands and damaged crops and grazing acreage. The fires generally have had a negative economic and social impact on the area. The residents of the area felt that creating and adopting a community wildfire protection plan would help them deal with fire issues on private land in the area and help them influence neighboring public agencies to reduce fire risks that exist on the neighboring public lands. Due to the nature of large wild land fires which have occurred in the area, it is evident that private land owners and government agencies such as the US Forest Service and Washington State DNR must work in a cooperative manner to reduce the risk of large destructive fires as well as working cooperatively in the suppression of wildfires when they occur.

The Havillah CWPP has been created collaboratively by a small team of local residents. It incorporates ideas, comments, advice and input from other local residents. The process for development of the plan included meetings and discussions with a variety of local residents, various groups, and sharing the plan with area government agency representatives to obtain their input and advice. Local residents, the Okanogan County Commissioners, and the State Forester have approved (without financial obligation or liability) the contents of the Havillah Community Wildfire Protection Plan. The plan will be updated and modified in this same manner as necessary.

#### **1.1.4.2.12 Methow Community Wildfire Protection Plan**

The Methow Community Wildfire Protection Plan for the Methow Valley watershed of North Central Washington is the result of three years of voluntary collaborative work among no fewer than fifty individuals, representing approximately 24 agencies, fire districts, non-governmental organizations, businesses and community members. In a region renowned for contentious planning processes and controversial natural resource issues, this group's efforts serve as testimony that common objectives can produce effective results among even the most diverse participants.

This Plan is intended to operate as a work in progress, and to inform other planning efforts that address land use and natural resource planning by providing the most current information

available concerning wildfire risk mitigation activities affecting public and private lands in the Methow Valley. The Plan will be an integral component to the Okanogan County CWPP.

Risk mitigation, fuels reduction, and ecosystem restoration activities are moving targets with ongoing needs for planning, prioritization and monitoring across ownerships. Consequently, the Methow CWPP is intended to be regularly updated and maintained through the collaborative framework initially established with the Methow Community Fire Plan Coordinating Group and the Okanogan County Fire Plan Steering Committee.

#### **1.1.4.2.13 Open Space Timber/Open Space Open Space Plans**

The Open Space Timber (OST) and Open Space Open Space (OSOS) Plans could be affected by some fuel reduction practices. The effects are more beneficial than hazardous, if handled appropriately. OST requires the sustenance of healthy commercial-grade timber. Fuels reduction has been shown to increase timber health. OSOS requires the sustenance of priority resources, other than timber. Landowners must ensure that fire-safety practices do not damage priority resources that keep them in the program in which they receive a property tax reduction.

#### **1.1.4.2.14 Master Program for Okanogan County Shoreline Management**

The Master Program for Shoreline Management outlines allowed/prohibited uses within specific shoreline zoning designations. All shoreline designations allow forest practices within shoreline areas. Non-forestry related mitigation actions would be looked at individually, hopefully either allowed or allowed by permit. Most of the identified action items would have no effect on the shoreline areas such as road signs, evacuation plan, public education, fire-safe building materials etc. The shoreline ordinance is currently being revised and will conform to all existing regulations and plans. Upon approval of the Okanogan County All Hazard Mitigation and Community Wildfire Protection Plans, the revised shoreline plan will acknowledge and support their adoption.

## Chapter 2: Documenting the Planning Process

### 2 Initiation

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop this plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

#### 2.1 *Description of the Planning Process*

The Okanogan County Community Wildfire Protection Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Chapter 1 of this document. The planning process included five distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed throughout the process):

1. **Collection of Data** about the extent and periodicity of hazards in and around Okanogan County. This included an area encompassing Okanogan, Ferry, and Stevens Counties to ensure a robust dataset for making inferences about hazards in Okanogan County specifically.
2. **Field Observations and Estimations** about risks, juxtaposition of structures and infrastructure to risk areas, access, and potential treatments.
3. **Mapping** of data relevant to pre-disaster mitigation control and treatments, structures, resource values, infrastructure, risk assessments, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee, to a public mail survey, news releases, public meetings, public review of draft documents, and acknowledgement of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, providing ample review and integration of committee and public input, followed by signing of the final document.

#### 2.2 *The Planning Team*

Leading planning efforts from Okanogan County was Chairman Bud Hover. Okanogan County Emergency Manager, Scott Miller and John Foster Fanning, Okanogan County Fire District #14 and Washington Department of Natural Resources representative, served as committee Co-Coordination. Northwest Management Project Co-Directors were Dr. William E. Schlosser and Tera R. King, B.S., with Vaiden Bloch M.S. Dr. Schlosser's education includes 4 degrees in natural resource management (A.S. geology; B.S. forest and range management; M.S. natural resource economic & finance; Ph.D. environmental science and regional planning). Mrs. King received a Bachelor of Science degree in natural resource management from the University of Idaho and Mr. Bloch has earned a Master of Science degree in forest products and a Bachelor of Science degree in forest management from the University of Idaho.

These individuals led a team of resource professionals that included Okanogan County government, incorporated city officials, fire protection districts, law enforcement, Washington Department of Natural Resources, Conservation Districts, the US Forest Service, fire mitigation specialists, resource management professionals, and hazard mitigation experts.

The planning team met with many residents of the County during the inspections of communities, infrastructure, and hazard abatement assessments. This methodology, when coupled with the other approaches in this process, worked adequately to integrate a wide spectrum of observations and interpretations about the project.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between cooperators.

When the public meetings were held, many of the committee members were in attendance and shared their support and experiences with the planning process and their interpretations of the results.

## **2.2.1 Multi-Jurisdictional Participation**

CFR requirement §201.6(a)(3) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans which impact multiple jurisdictions. This Community Wildfire Protection Plan is applicable to the following jurisdictions:

- Okanogan County, Washington
- City of Brewster
- City of Okanogan
- City of Omak
- City of Oroville
- City of Pateros
- City of Tonasket
- Town of Conconully
- Town of Coulee Dam
- Town of Elmer City
- Town of Nespelem
- Town of Riverside
- Town of Twisp
- Town of Winthrop
- Confederated Tribes of the Colville Reservation

These jurisdictions were represented on the planning committee, in public meetings, and participated in the development of hazard profiles, risk assessments, and mitigation measures. The monthly planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in a combination of the following ways:

- Planning committee leadership visits to scheduled municipality public meetings (e.g., County Commissioner meetings, City Hall meetings) where planning updates were provided and information was exchanged.
- One-on-one visits between the planning committee leadership and the representatives of the municipalities (e.g., meetings with County Commissioners, City, Fire Districts, or communities).
- Special meetings at each jurisdiction by the planning committee leadership requested by the municipality involving elected officials (mayor and County Commissioners), appointed officials (e.g., County Assessor, Sheriff, City Police), municipality employees,



local volunteers (e.g., fire district volunteers), business community representatives, and local citizenry.

- Written correspondence was provided monthly between the planning committee leadership and each municipality updating the cooperators in the planning process, making requests for information, and facilitating feedback.

Planning committee leadership (referenced above) included: Commissioner Bud Hover, Scott Miller, John Foster Fanning; and Dr. William Schlosser, Tera King, and Vaiden Bloch of Northwest Management, Inc.

Like other rural areas of Washington and the USA, Okanogan County's human resources have many demands put on them in terms of time and availability. Several of the elected officials (County Commissioners and City Mayors) do not serve in a full-time capacity; some of them have other employment and serve the community through a convention of community service. Recognizing this, many of the jurisdictions decided to identify a representative to cooperate on the planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction. In the case of the Okanogan County Commissioners, Commissioner Hover was a regular attendee of the planning committee meetings and reported to the Board on the progress of the Okanogan County CWPP. In another example, Okanogan City Fire Chief, Gordon Hennigs, was appointed as the City of Okanogan representative on the planning committee by Okanogan Mayor Michael Blake.

## 2.3 *Planning Committee Meetings*

The following list of people who participated in the planning committee meetings, volunteered time, or responded to elements of the Okanogan County Community Wildfire Protection Plan's preparation.

NAME	ORGANIZATION
• Bill Schlosser.....	Northwest Management, Inc.
• Bill Vallance.....	Fire District #15
• Brad Armstrong .....	Okanogan County Fire District #
• Bud Hover .....	Okanogan County Commissioner
• Chris Branch .....	North Central Washington RC&D
• Chris McCuen .....	BIA Fire Management
• Chuck Johnson .....	Washington DNR
• Dale Swedberg.....	Washington Fish and Wildlife
• Don Waller .....	Fire District #6
• Duane VanWoert.....	Tonasket Ranger District
• Gordon Hennigs .....	City of Okanogan Fire Dept. & Fire District #3
• Grant Timentwa.....	Colville Tribe
• Greg Roberts.....	Washington DNR
• Ike Cawston .....	Colville Tribe
• Jim Wheeler .....	Proposed Okanogan County Fire District #16
• John Foster .....	Washington DNR and Fire District #14
• Judi Fox.....	Tunk Valley Resident
• Kevan Roberts .....	Washington DNR
• Kevin Bowling.....	Omak Fire Department
• Kevin Fox .....	Tunk Valley Resident

- Laura Clark.....Okanogan Conservation District
- Leahe Swayze.....Methow Valley Ranger District
- Lorah Waters.....Methow Local Coordinating Group
- Marsha Pakootas .....Bureau of Indian Affairs
- Mike Lambert .....Pateros Fire Department
- Nick Christoph.....Okanogan County
- Pete Soderquist.....Methow Valley Ranger District
- Richard Rooney .....Colville Tribe
- Richy Harrod .....Okanogan/Wenatchee National Forest
- Ron Wonch .....Washington DNR
- Scott Miller .....Okanogan County Emergency Management
- Scott Rodgers .....Mount Tolman Fire Center
- Sharon Barton-Wood .....Okanogan/Wenatchee National Forest
- Sheron Sheldon .....Red Cross
- Ted Murray.....Okanogan County GIS
- Tera King.....Northwest Management, Inc.
- Tim Vugteveen .....Washington DNR

### **2.3.1.1 Committee Meeting Minutes**

The Planning committee began meeting in March of 2006 to lay the ground work for the Okanogan County CWPP. In April of 2006, the planning committee began accepting proposals from contractors interested in assisting the planning committee in gathering data and completing the project. Northwest Management, Inc. was hired and began attending planning committee meetings in June.

#### **2.3.1.1.1 June 7<sup>th</sup>, 2006**

##### Agenda Item #1 – Call to Order:

1000 hours; Scott Miller called the meeting to order and made round table introductions of the committee. Tera initiated a sign-in sheet. John noted that members should add their hours of participation to the sign in sheet as a way of keeping track. Laura Clark motioned to approve the revised minutes from last meeting and Gordon Hennigs seconded.

##### Agenda Item #2 – Overview of Process:

Bill gave a quick review of the CWPP process as discussed at the last meeting and reviewed committee members' responsibilities. Due to the aggressive completion date of January 15<sup>th</sup>, 2007, it is important that member's review draft materials and provide feedback as soon as possible. NMI handed out information packets to committee members which included an agenda, draft timeline, mission/vision/goals statements, press release #1, resources and capabilities questionnaire, example R&C questionnaire, draft public survey, CWPP handbook, National Fire Plan handout with 10-year comprehensive strategy, Region X crosswalk, and WUI definitions paper. It was established that NMI will take committee minutes, send the minutes to John F. for review, and then John will forward the edited version on the rest of the committee. NMI requested that John forward the past minutes to NMI. The committee then proceeded to review the tentative timeline outlining the following dates:

July 12<sup>th</sup>  
 August 9<sup>th</sup> (Omak Stampede 10<sup>th</sup> – 13<sup>th</sup>)  
 August 14<sup>th</sup> – 18<sup>th</sup> Public Meetings

September 13<sup>th</sup> (County Fair 14<sup>th</sup> – 17<sup>th</sup>)  
October 11<sup>th</sup>  
November 8<sup>th</sup>  
December 13<sup>th</sup>

Meetings will occur on the 2<sup>nd</sup> Wednesday of the month at 1000 hours. The committee recognized that the Omak Stampede and the County Fair may be good opportunities for public involvement. NMI suggested that we set up a booth with materials and information regarding the CWPP and AHMP projects. The week of August 14<sup>th</sup> – 18<sup>th</sup> were designated for potential public meeting dates in the communities of Methow, Omak, North End, and Brewster. These may be a combination of evening, lunch, and possibly weekend meetings to accommodate all prospective attendees. Laura Clark will help NMI contact and schedule local venues. Lorah Waters may be able to assist with advertising.

Agenda Item #3 – All Hazard Mitigation Plan Process:

Bill and Scott briefly reviewed how the CWPP process will coordinate with the All Hazard Mitigation process and additional committee members that need to be invited. Signage of the contract will occur by the end of next week. It was decided that committee meetings should occur on the same day – CWPP at 1000 hours and AHMP at 1300 hours.

Agenda Item #4 – Discuss Mission, Vision, and Goal Statements:

Bill asked the committee to review the mission, vision, and goals statement and send edits to NMI by the next meeting.

Agenda Item #5 – Existing CWPP projects:

There are four existing local CWPP projects in Okanogan County Havillah and Methow are complete, the others are in various states of completion. Lorah and Scott volunteered to track down drafts of these documents. It is imperative that these documents are integrated with the County process as much as possible.

In addition, the Colville Tribe is working on a fire treatment plan that should be dovetailed with the County CWPP as well. It is currently in draft form, but Grant may be able to get NMI a copy. Tribal land in the County will be considered part of the planning area; however, providing specific information will have to be the responsibility of the Tribe. It is important to the committee that the Tribe participates in this process.

Agenda Item #6 – Public Survey and Press Release:

The committee reviewed the draft press release and decided that it was too long to hold readers' attention. Laura provided an edited version. NMI agreed to send a revised press release via email on June 8<sup>th</sup>. Edits to press release need to be sent to NMI by June 12<sup>th</sup>, so it can be sent to media contacts as soon as possible. Scott will adjust the contact the information according the locale it is being sent; however, the Commissioners and Scott would appear as contacts on all versions.

Bill quickly went through the questions on the AHMP public survey and asked the committee to review and provide edits to NMI by June 14<sup>th</sup>. The survey will be printed on County letterhead with Commissioner Hover's signature and sent to 300 homeowners in the County, which will include absentee and fee landowners.

Agenda Item #7 – Community Risk Assessments:

John and Bill reviewed the potential layouts of the community risk assessments and difference between organizing them by identified communities or by neighborhoods as was done in Ferry County. It was decided that the committee would like the assessments to be organized by

neighborhoods to the extent possible. This will depend on the participation of the local fire chiefs. Gordon offered to schedule a County Fire Chief's meeting for June 28<sup>th</sup> in order to facilitate drawing potential neighborhood boundaries on a map. During the community assessment phase, Tera will be visiting communities throughout the County to evaluate the potential risk to individual communities, subdivisions, etc. This process can be better facilitated by obtaining local tour guides such as fire chiefs to her around their jurisdictions. Tera will be contacting potential tour guides this month.

#### Agenda Item #8 – Resources and Capabilities:

Bill explained the purpose and the benefit of the resource and capabilities questionnaires that need to be filled out by the local emergency response organizations such as the fire departments, ambulance services, wildfire agencies, etc. NMI was asked to send the questionnaires out electronically. It was asked that these be sent back to NMI as soon as possible. This information can also be gathered at the Fire Chief's meeting on the 28<sup>th</sup>.

#### Agenda Item #9 – Draft Map Products:

There was only a short amount of time to discuss the map products presented; however, Bill did spend some time explaining the importance of the wildland urban interface map and different risk assessment maps. He also noted that the definitions used to create this type of draft WUI map were explained in detail in one of the handouts. Currently, critical infrastructure has not been included in this version of the WUI. Due to the lack of time, it was decided that review of the WUI map and others would be on the agenda for the next meeting.

#### Agenda Item #10 – Discuss Proposed and Past Mitigation Projects:

Bill briefly discussed what NMI was looking for as far as past, ongoing, or proposed wildfire mitigation projects in the County. Projects may include federal, state, County, or tribal fuels reduction projects, defensible space projects, educational campaigns, etc. It was asked that this information be sent to NMI as soon as possible in whatever form it was available.

#### Agenda Item #11 – Task List and Assignments:

*\*\*Information can be sent to Tera King at [king@consulting-foresters.com](mailto:king@consulting-foresters.com).\*\*\**

1. Send NMI local CWPP – Lorah (x3) and Scott
2. Send NMI previous minutes – John F.
3. Reserve meeting room for established dates – Scott
4. Begin reserving public meeting venues – Laura and NMI
5. Review Mission, Vision, and Goals Statements by next meeting – Committee
6. Send NMI press release edits by June 12 (Monday) – Committee
7. Send NMI any relevant tribal information/data – Grant and Chris McCuen
8. Review public survey and send edits to NMI by June 14 (Wednesday) – Committee
9. Send NMI County letterhead by June 12 – Scott
10. Send NMI any existing “neighborhood” boundary maps ASAP – John F. plus any others
11. Schedule Fire Chief's meeting for June 28<sup>th</sup> (and send info to NMI) – Gordon
12. Send out Resources and Capabilities questionnaires electronically – NMI
13. Fill out Resources and Capabilities questionnaires by next meeting – Fire Departments, Wildfire Agencies, Ambulance Services, etc.
14. Send NMI any info/data on proposed or recently past fire risk reduction type projects – Committee (specifically Forest Service, DNR, Lorah)
15. Send NMI organization logos by the next meeting - Committee

#### Agenda Item #12 – Adjournment:

1245 hours – Scott adjourned the meeting and asked that Tera email out a list of homework assignments to the committee.

Next Meeting: July 12<sup>th</sup>, 2006 @ Okanogan Administration Building, Sheriff's Training Room

1000 hours – CWPP Committee

1300 hours – AHMP Committee

### **2.3.1.1.2 July 26<sup>th</sup>, 2006**

#### Agenda Item #1 – Call to Order:

1000 hours; Scott Miller called the meeting to order and made round table introductions of the committee. Tera initiated a sign-in sheet.

#### Agenda Item #2 – Neighborhoods:

Tera recently attended the Okanogan County Fire Chiefs meeting, at which she asked that each chief begin to identify “neighborhoods” within and surrounding their district. The DNR also submitted draft neighborhood boundaries. Tera explained that using this information combined with the Okanogan County Watershed boundaries; NMI was able to come up with a cohesive map identifying potential neighborhoods. Tera noted that this was a draft map that should be further edited. Tera will also email the committee a document that will help define what a “neighborhood” is.

#### Agenda Item #3 – Community Assessments:

Tera handed out the draft community assessments. The assessments are grouped based on the neighborhoods, but each community or subdivision is mentioned individually. Tera explained that she had spent two weeks assessing the County, but this was not near enough time to see everything. Therefore, it is very important that the committee edit this part of the document heavily. Edits need to be sent to Tera by August 11<sup>th</sup>.

Two residents from the Tunk Valley area, Judi and Kevin Fox, attended the meeting and made the following list of comments regarding the Tunk Valley:

- One-way in, one-way out access road
- High box canyon
- Riverside Fire Department responds to fires in the Tunk Valley when they can
- Tunk Valley needs a good safety zone
- There have been 52 additional PUD installations, but there are currently 290+ landowners
- They have purchased land for the future fire department site
- High frequency and severity fire history
- No water storage

#### Agenda Item #4 – Maps:

Bill discussed the draft maps that NMI has developed since the last meeting. These included Critical Infrastructure, Wildland Urban Interface, Historic Fire Regime, Fire Regime Condition Class, and Fire Prone Landscapes. Bill asked if the North Cascades Highway should be added to the WUI designation as Infrastructure WUI. The committee thought that this would be a good idea due to its heavy use during the fire season. Bill noted that during the lunch break, these maps would be available for further edits, additions, and comments on the back table.

As a side note, Bill asked if there were any municipal watersheds that needed to be included on the maps and/or added to the WUI. The committee acknowledged that the Okanogan

Watershed included Salmon Creek and that the Sun Mountain Lodge in Winthrop took water out of Patterson Lake. There are also several irrigation districts.

#### Agenda Item #5 – Public Meetings:

Tera went through the tentative public meeting schedule for the week of August 21<sup>st</sup>. She also handed out the draft press release flyer that will be sent to all area newspapers and radio stations once it is finalized. The flyers will also be sent to committee members for distribution around the County. Any edits to the press release should be sent to Tera as soon as possible. Tera noted that it was the committee's responsibility to come to the meetings for support and also to help introduce NMI to the public. The following is the tentative schedule.

<b>Tuesday, August 22<sup>nd</sup></b>	<b>Wednesday, August 23<sup>rd</sup></b>	<b>Thursday, August 24<sup>th</sup></b>
	Tonasket – 12 pm Tonasket Senior Center	Brewster – 12:30 pm Columbia Steak House
Twisp – 6pm Twisp River Pub? Twisp Senior Center?	Okanogan – 6pm County Commissioner's Hearing Room	Nespelem – 6pm Community Center or Long House?

As part of the public involvement process, there will also be information on the CWPP and AHMP presented at a booth at the County Fair in September. The DNR, USFS, BIA, and NMI would be willing to host the booth. Laura Clark is going to head up the organization of this.

#### Agenda Item #6 – Public Survey:

NMI updated the committee on the status of the public survey. Currently, the response rate is 34% and NMI is just sending out the third mailing. They expect the response rate to double before the end of the project. 400 surveys were originally sent out to Okanogan residents.

#### Agenda Item #7 – Resources and Capabilities:

NMI has received about half of the fire department questionnaires. Gordon and John have been assisting in getting the remaining fire departments to fill these out and send them to Tera.

John initiated a discussion on the lack of a rural fire department and the consequences in the Aeneas Valley. The residents voted not to form a department last year, but indicated that the organizers are making a go-for-it again this year. When a fire breaks out in an area that does not have a fire protection district, there is no official to initiate WA State MOB (Mobilization); therefore all structural protection costs are the responsibility of the County and responding fire protection districts and would easily far exceed all available budgets. The financial impact to Okanogan County will be devastating. The potential threat for loss of homes and life is very real.

Ike noted that there was a limited tax base on the Reservation to support a fire department; therefore, they are better protected by forming good MOU's with other departments and agencies. One problem they have on the Reservation is that they cannot use suppression funding for structural protection.

#### Agenda Item #8 – Logos:

NMI would like to include all of the committee member's organization's logos on the maps and documents at the public meetings, so send these to Tera or Bill as soon as possible.

#### Agenda Item #9 – Task List and Assignments:

*\*\*Information can be sent to Tera King at king@consulting-foresters.com.\*\**

1. Email committee proposed “Neighborhood” definition - NMI
2. Send NMI previous minutes – John F.
3. Send Tim “Neighborhood” and “Landowner” maps – NMI
4. Email community assessments to committee - NMI
5. Send Tera edits to the community assessments by August 11<sup>th</sup> – Committee
6. Finalize public meeting venues and press release – NMI
7. Organize booth at County Fair - Laura
8. Email Grant priority scheme & structure layer - NMI
9. Send NMI any relevant tribal information/data – Grant and Chris McCuen
10. Fill out Resources and Capabilities questionnaires by next meeting – Fire Departments, Wildfire Agencies, Ambulance Services, etc.
11. Send committee WUI definitions - NMI
12. Send NMI any info/data on proposed or recently past fire risk reduction type projects – Committee (specifically Forest Service, DNR, Lorah)
13. Send NMI organization logos by the next meeting - Committee

Agenda Item #10 – Adjournment:

1200 hours – Meeting was adjourned for in-house pizza lunch. Committee members were encourage to stick around for the afternoon meeting and to edit the maps.

Next Meeting: August 30<sup>th</sup>, 2006 @ Okanogan Grainger Building, Sheriff’s Training Room

1000 hours – CWPP Committee

1300 hours – AHMP Committee

**2.3.1.1.3 August 30<sup>th</sup>, 2006**

Agenda Item #1 – Call to Order:

1000 hours; Tera called the meeting to order. Scott noted that several members of the committee were busy with all of the fire activity in the County and would not be able to make it.

Agenda Item #2 – Public Meeting Overview:

Tera gave a quick overview on the public meetings that occurred last week. She said that considering all the fire activity in the area, she thought the meetings didn’t have too bad of a turnout and that several good comments were received. There were two in attendance at the Twisp meeting, six in Okanogan, 7 in Tonasket, and zero in both Brewster and Nespelem.

Agenda Item #3 – Housekeeping Items:

Tera reminded the committee that there were still outstanding Resources and Capabilities surveys from the fire departments as well as the agencies. Also, due to the short timeline on this project, review and edits of the community assessments and the draft plan needed to be sent to NMI right away.

Agenda Item #4 – Draft Review:

Tera handed out the 1<sup>st</sup> rough draft of the CWPP and went over the general formatting and set up of the document. The public survey results to date were included in this version of the draft and were discussed at length. The committee had several comments regarding the origin of some of the data throughout the plan. Tera asked that the committee review the document and send edits or questions to NMI before the next meeting. Chris noted that the BIA had better wildfire extent and ignition profile data than what was used in the document. He will work on



getting this sent to NMI. There were several questions regarding the WUI and how it was used. It was evident from the questions and concerns that the committee needs to have a formal, in-depth discussion of the Wildland-Urban Interface designation. This will be on the agenda for the next meeting.

Due to the recent fires in the area, there was a discussion on the Loup Loup power line corridor. Paul from the PUD had specific details on how critical this line was to residents in the Methow Valley. If this power line was lost, people in that area may not have power for a very extended period of time. Also, the line coming up the valley from Pateros is not adequate to supply the whole valley with power. In order to supply Twisp with basic facilities, all of the other distribution lines would have to be closed off, leaving other areas without power. Also, anyone north of Twisp including Winthrop and Mazama would be completely out of luck.

#### Agenda Item #5 – Task List and Assignments:

*\*\*Information can be sent to Tera King at king@consulting-foresters.com.\*\*\**

1. Email Chris R&C survey - NMI
2. Find out if State Fish and Wildlife is under the DNR responsibility – NMI
3. Add local CWPP projects to draft – NMI
4. Send NMI BIA ignition and extent data – Chris McCuen
5. Send Tera edits to draft document by next meeting – Committee
6. Set up booth at County Fair – NMI
7. Complete missing elements of the draft – NMI and committee
8. Send NMI any other relevant tribal information/data – Grant and Chris McCuen
9. Complete outstanding Resources and Capabilities questionnaires by next meeting – Fire Departments, Wildfire Agencies, Ambulance Services, etc.
10. Send NMI organization logos by the next meeting - Committee

#### Agenda Item #6 – Adjournment:

1200 hours – Meeting was adjourned.

Next Meeting: September 28th, 2006 @ Okanogan Grainger Building, Sheriff's Training Room

1000 hours – CWPP Committee

1300 hours – AHMP Committee

#### **2.3.1.1.4 September 28<sup>th</sup>, 2006**

#### Agenda Item #1 – Call to Order:

1000 hours; Tera called the meeting to order while passing around the agenda and sign in sheet.

#### Agenda Item #2 – Housekeeping Items:

Tera summarized the changes to the draft plan and talked about the information we still need for the plan. We still need information from the Tribe, Fire Districts, and the USFS. The Tribe has some data (community assessments and community data), thus far they have not provided it to us. We need it and would like them to provide it ASAP. Drop dead date is October 13, 2006 (Friday), for inclusion in the public meeting review.

John also has several pages of comments to include and will send them via e-mail.

Tera said we are missing some agency information (NPS, USFS, Tribe) on fuel reduction projects. Please provide this so we can complete the GAP analysis on treatments. The Tribe said they would try to get them by October 13 to Tera.

Resources and Capabilities: John will run herd on some of the districts in his area. Dist 5 does not exist. Omak FD will run herd on a couple others. Committee members will assist with getting the missing. USFS R&C guide is missing as well. Please send in your edits ASAP. The time is now...

Public Review for CWPP & AHMP  
December for public review  
Jan/Feb for adoption

Draft review: We have received some comments, but we need additional changes now. The file is available on the ftp site. Bill put the connection data on the board.

#### Agenda Item #3 – Draft Review:

Tera reviewed the changes to the plan, especially the mitigation measures, and cost summary information. She talked about the projects the committee and the public provided and how costs were derived, and how the plan is organized. Many are tied to the neighborhoods.

Discussed action plans and what they mean for treatments versus zones. Tera explained the difference and how they would be implemented.

#### Comments:

John talked about a couple projects in Bonaparte Lake, it shows 2 structures when in reality it might be 30 structures. Ted talked about structures in the County and the limited data we have available. Bill asked to have the plan information updated, more than the map data, although both would be good to have. NMI included all of the local CWPP content in the County CWPP.

#### Agenda Item #4 – WUI Discussion:

Bill discussed the WUI designation process, and the responsibility of the County to define the WUI. It is the responsibility of the Federal Agencies to use the WUI developed by the CWPP planning committee. Bill described the analytical process used to develop the WUI and the edge matching of the WUI with neighboring counties. Bill described the designations of the WUI as they apply to population density as a planning tool. Committee comments looked at the source of the data, specifically the location of all structures in the County. It is felt that the structure layer is lacking. They asked NMI to revise the structure layer and recreate the WUI for the next meeting, particularly looking at Bonaparte, Pontiac Ridge, Toroda Creek, Limebelt, and other areas.

#### Agenda Item #5 – Task List and Assignments:

*\*\*Information can be sent to Tera King at king@consulting-foresters.com.\*\*\**

1. Send NMI BIA ignition and extent data – Chris McCuen
2. Send Tera edits to draft document by Oct 13 – Committee
3. Complete missing elements of the draft – NMI and committee
4. Send NMI any other relevant tribal information/data – Grant and Chris McCuen
5. Complete outstanding Resources and Capabilities questionnaires by Oct. 13 – Fire Departments, Wildfire Agencies, Ambulance Services, etc.
6. Send NMI organization logos by the next meeting - Committee

#### Agenda Item #6 – Adjournment:

1200 hours – Meeting was adjourned.

Next Meeting: October 26<sup>th</sup>, 2006 @ Okanogan Grainger Building, Sheriff's Training Room

1000 hours – CWPP Committee

1300 hours – AHMP Committee

#### **2.3.1.1.5 October 26<sup>th</sup>, 2006**

##### Agenda Item #1 – Call to Order:

1000 hours; Scott made welcoming comments and asked for round table introductions as there were several new faces.

##### Agenda Item #2 – Housekeeping Items:

Tera reiterated that the planning process was winding down and that any information that was still outstanding needs to be sent to NMI as soon as possible. The document is still missing Resource and Capabilities summaries from Fire Districts #8, #10, #11, and #12 as well as the Tribe. We are also still waiting on the tribal data regarding fire starts, community assessments, etc. Chris McCuen is working on getting that info together and will be sending it to NMI shortly.

##### Agenda Item #3 – Draft Review:

Much of the information in the current CWPP document is the same as was presented at the previous meeting; however, all of the comments received by NMI to date have been included. Much of the edits were misstatements or typos with very few major content changes. John Foster did submit significant changes to the “Fire Protection” sections of the community assessments regarding a more detailed and accurate description of the jurisdictions’ relationships in the County. He also provided corrections to the “Mutual Aid”, “Fire Reporting”, and “Burn Permits” sections of the document. During the committee discussion regarding these changes, it was noted that no fire districts actually issue burn permits and that the County’s burn permits only apply to orchard land clearing. Additionally, Richy Harrod is going to send Tera a copy of the USFS mutual aid agreement for inclusion.

Need to make global corrections in the documents: Pine Mountain Neighborhood should be Pine Creek Neighborhood and all references to the Aeneus Valley should be spelled Aeneas Valley. The committee would also like to add a general recommendation regarding their support of salvage harvests in burned areas where they affect homes, escape routes, and other infrastructure in the identified wildland urban interface.

Other new additions to the document included the prioritization of the recommendations’ action items, the agencies’ project information, and updated structure information. Tera will email the committee the Excel spreadsheets of this information for review. A mechanism for ranking the Neighborhoods based on structures per acre and Fire Prone Landscapes score was discussed. It was decided that this analysis tool contradicted several of the other analyses used due to the boundaries of the neighborhoods. Unless additional components can be added to the system, such as Fire Prone Landscapes, then this mechanism is not useful. Tera will work on developing a more complete system or report to the committee that the results were still inconclusive using the additional data components due to the Neighborhood boundaries.

##### Agenda Item #4 – Appendices:

Tera presented the committee with the completed Appendices for both the CWPP and AHMP documents. She explained that all of the maps will be updated to reflect changes as of this meeting. Additionally, the prioritization tables will be included in the Appendices once completed.

##### Agenda Item #5 – New WUI Layer:

Tera reiterated the WUI discussion at the last meeting regarding the need to develop a more accurate structure layer. Instead of using the County’s address points, NMI has redone the

structure layer using structure location points pulled from the aerial maps of the County. This method will give a better reflection of the actual location of all (or nearly all) of the structures in the County. Using this new structure layer, which added about 7,000 structures, the WUI map was redrawn. Tera showed that although the boundaries of the “In the WUI” versus “Out of the WUI” did not change significantly, the colors depicting the intermix/interface areas versus the rural areas (brown versus yellow) did change dramatically. The committee agreed that this map better depicted the location and density of structures in the County.

#### Agenda Item #6 – Updated Project Map:

Tera also presented a new Project Map. This map shows all of the committee/public recommended projects as well as planned or proposed projects submitted by the DNR and Forest Service. It was noted that a few of the DNR projects sent to NMI were missing from the map and that although the written descriptions of the Methow Valley Ranger Districts projects was included, they had not yet sent the new map of the location of these projects. Tera will work on getting these projects shown accurately on the map.

#### Agenda Item #7 – Public Review:

Tera is going to try and get all of the documents out for a one month public review period by November 1<sup>st</sup>. She will be mailing the documents to at least one public venue in each community as well as several governmental offices such as the Ranger District’s offices and the Courthouse. She will also prepare a press release to send to the local papers announcing each of the venues.

Glenda and Scott will be visiting city councils during November and December to deliver the draft documents and answer questions.

#### Agenda Item #8 – Adjournment:

1200 hours – Meeting was adjourned.

Next Meeting: December 13<sup>th</sup>, 2006 @ Okanogan Grainger Building, Sheriff’s Training Room

1000 hours – CWPP Committee

1300 hours – AHMP Committee

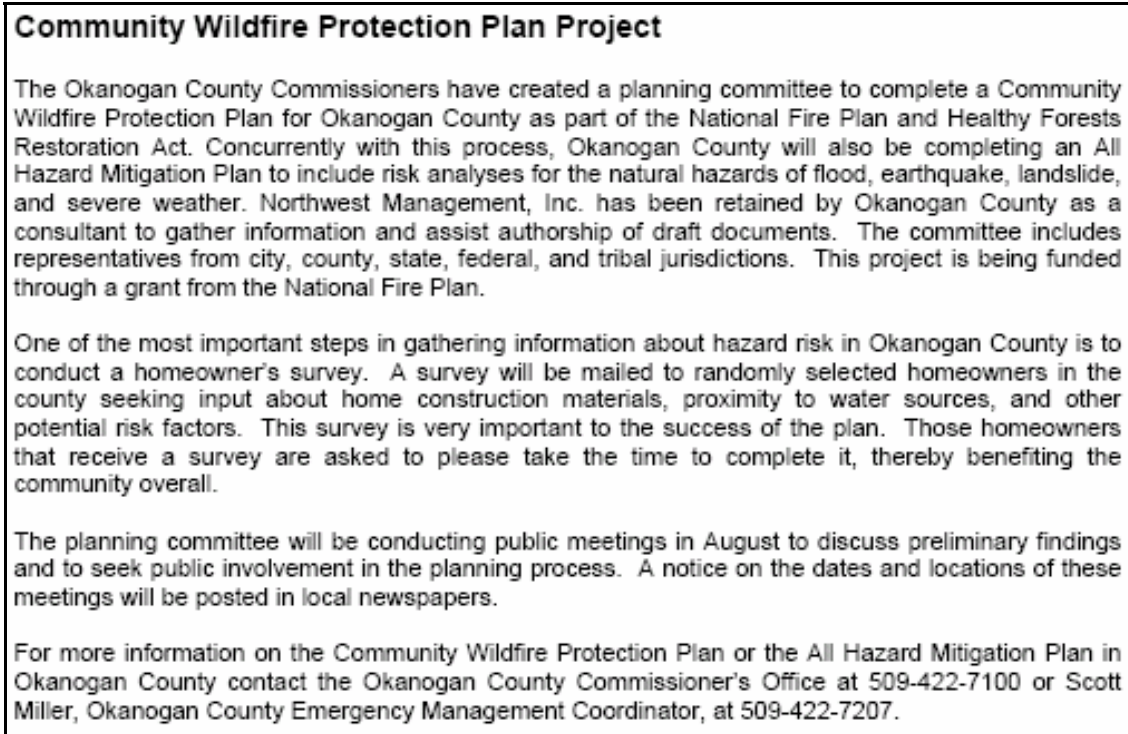
## **2.4 Public Involvement**

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases this led to members of the public providing information and seeking an active role in protecting their own homes and businesses, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning.

### **2.4.1 News Releases**

Under the auspices of the Okanogan County planning committee, news releases were submitted to Star Publishing, the *Gazette Tribune*, the *Methow Valley News*, the *Omak Chronicle*, the *Quad City Herald*, and the *Wenatchee World* as well as the local radio stations, KOMW Omak and KVLK. Informative flyers were also distributed around town and to local offices within the communities.

**Figure 2.1. Press Release sent on June 8<sup>th</sup>, 2006.**



## **2.4.2 Public Mail Survey**

In order to collect a broad base of perceptions about wildland fire and individual risk factors of homeowners in Okanogan County, a mail survey was conducted. Approximately 400 residents of Okanogan County were randomly selected to receive a mail survey.

The public mail survey developed for this project has been used in the past by Northwest Management, Inc., during the execution of other Mitigation Plans. The survey used The Total Design Method (Dillman 1978) as a model to schedule the timing and content of letters sent to the selected recipients. Copies of each cover letter, mail survey, and communication are included in Appendix II.

The first in the series of mailings was sent June 26, 2006, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Okanogan County if they would complete and return the survey. The free map incentive was tied into assisting their community and helping their interests by participating in this process. Each letter also informed residents about the planning process. A return self-addressed envelope was included in each packet. A postcard reminder was sent to the non-respondents on July 11, 2006, encouraging their response. A final mailing, with a revised cover letter pleading with them to participate, was sent to non-respondents on July 25, 2006.

Surveys were returned during the months of June, July, August, and September. A total of 213 residents responded to the survey as of August 28, 2006. The effective response rate for this survey was 53%. Statistically, this response rate allows the interpretation of all of the response variables significantly at the 99% confidence level.

### 2.4.2.1 Survey Results

A summary of the survey's results will be presented here and then referred back to during the ensuing discussions on the need for various treatments, education, and other information.

Of the 213 respondents in the survey, 60% were returned from Okanogan County landowners and while 40% were from homeowners. Of these, about 70% said their property in Okanogan County was their primary residence. Approximately 18% of respondents were from the Tonasket area, 11% from Oroville, 9% were from Omak, and 9% were from Winthrop.

**Table 2.1. Community Response to Public Mail Survey.**

Community	Number Responded	Percent
Oroville	23	11%
Riverside	8	4%
Tonasket	37	18%
Twisp	12	6%
Winthrop	17	9%
Omak	18	9%
Okanogan	12	6%
Coulee Dam	6	3%
Brewster	10	5%
Pateros	8	4%
Conconully	2	1%
Elmer City	0	0%
Nespelem	0	0%
Havillah	1	0%
Loomis	2	1%
Molson	3	1%
Chesaw	6	3%
Malott	4	2%
Mazama	8	4%
Wauconda	7	3%
Carlton	4	2%
Methow	4	2%
Nighthawk	1	0%
Aeneas Valley	3	1%
Other	8	4%

The vast majority of the respondents (93%) correctly identified that they have emergency telephone 911 services in their area. Approximately 65% of residents indicated that their address was clearly visible from the nearest public road and 75% responded that their homes were within a taxing fire district.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Approximately 60% of respondents living in a rural area indicated their homes were covered with a metal roofing material (e.g. aluminum, tin). About 35% of these residents indicated their homes were covered with a composite (e.g. asphalt shingles) roofing material and 5% of respondents indicated they have a wooden roofing material such as shakes or shingles. When asked how many trees were within 250 feet of their homes 5% said none, 46% indicated less than 10, 24% said between 10 and 25, and 25% said more than 25.

The average driveway length of respondents to the survey was 1,056 feet long (0.2 miles). The longest reported was 7 miles. Of those respondents (20%) with a driveway over ¼ mile long, approximately 36% do not have turnouts allowing two vehicles to pass. Approximately 66% of the respondents indicated an alternate escape route was available in an emergency which cuts off their primary driveway access. 11% of respondents indicated that a stream crossed their driveway and 23% said that a stream or other body of water was available for drafting somewhere on their property.

Survey recipients were asked to report emergency services training received by members of the household. Their responses are summarized in Table 2.2.

**Table 2.2. Emergency Services Training received by household.**

Type of Training	Percent of Households
Wildland Firefighting	28%
City or Rural Fire Fighting	16%
EMT (Emergency Medical Technician)	19%
Basic FirstAid/ CPR	80%
Search and Rescue	17%

When asked if their home, property, or business was located in a place that put it at risk to a hazard, 62% indicated that their property was at risk to wildfires, 20% were at risk to floods, 40% were at risk to earthquakes, 14% were at risk to landslides, 60% were at risk to wind storms or tornadoes, 77% were at risk to winter storms, 78% were at risk to thunder and lightning storms, and 61% were at risk to droughts. Several respondents also listed power lines, neighbors, herbicide overspray, dam failure, rolling rocks, plane crashes, irrigation ditch malfunction, nuclear attacks, erosion, and old mine shafts as potential hazards.

Residents were asked to indicate which, if any, of the disasters listed in Table 2.3 have affected their home, property, or business within Okanogan County during the past 10 years.

**Table 2.3. Disasters affecting homes in Okanogan County.**

↓ Hazard ↓	Percent of respondents reporting hazard occurrence during the period 1996-2006, near their home.	If YES, Complete these questions...	Percent of respondents reporting damage to their home.	Percent of respondents reporting damage to their property.	Percent of respondents reporting damage to their business.	Approximate average damage caused by each hazard (during the period 1993-2003)
Wildfire	26%	→	44%	78%	0%	\$4,944
Flood	8%	→	22%	89%	0%	\$10,938
Earthquake	3%	→	100%	50%	0%	\$0
Landslide	2%	→	50%	50%	0%	\$0
Severe Storms:		→				
Wind Storm	24%	→	42%	58%	16%	\$1,558
Thunderstorm	28%	→	53%	53%	6%	\$105
Winter Storm	26%	→	55%	36%	9%	\$1,622
Drought	20%	→	29%	64%	14%	\$3,036



Respondents were asked to complete a fuel hazard rating worksheet to assess their home's fire risk rating. An additional column titled "results" has been added to the table, showing the percent of respondents circling each rating (Table 2.4).

**Circle the ratings in each category that best describes your home.**

Table 2.4. Fuel Hazard Rating Worksheet		Rating	Results
<b>Fuel Hazard</b>	Small, light fuels (grasses, forbs, weeds, shrubs)	1	50%
	Medium size fuels (brush, large shrubs, small trees)	2	30%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	20%
<b>Slope Hazard</b>	Mild slopes (0-5%)	1	61%
	Moderate slope (6-20%)	2	24%
	Steep Slopes (21-40%)	3	11%
	Extreme slopes (41% and greater)	4	3%
<b>Structure Hazard</b>	Noncombustible roof and noncombustible siding materials	1	32%
	Noncombustible roof and combustible siding material	3	51%
	Combustible roof and noncombustible siding material	7	4%
	Combustible roof and combustible siding materials	10	14%
<b>Additional Factors</b>	Rough topography that contains several steep canyons or ridges	+2	Average -1.6 pts
	Areas having history of higher than average fire occurrence	+3	
	Areas exposed to severe fire weather and strong winds	+4	
	Areas with existing fuel modifications or usable fire breaks	-3	
	Areas with local facilities (water systems, rural fire districts, dozers)	-3	

#### Calculating your risk

Values below are the average response value to each question for those living in both rural and urban areas.

$$\begin{array}{rcl}
 \text{Fuel hazard} & \underline{1.8} & \times \text{Slope Hazard } \underline{1.6} = \underline{2.9} \\
 \text{Structural hazard} & + & \underline{3.4} \\
 \text{Additional factors} & (+ \text{ or } -) & \underline{-1.6} \\
 \text{Total Hazard Points} & = & \underline{4.7}
 \end{array}$$

**Table 2.5. Percent of respondents in each risk category as determined by the survey respondents.**

01% – Extreme Risk = 26 + points
04% – High Risk = 16–25 points
22% – Moderate Risk = 7–15 points
73% – Low Risk = 6 or less points



Finally, respondents were asked “If offered in your area, would members of your household attend a free or low cost, one-day training seminar designed to share with homeowners how to reduce the potential for casualty loss surrounding your home?” Almost half, 47% of respondents, indicated a desire to participate in this type of training.

Homeowners were also asked, “How Hazard Mitigation projects should be funded in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?” Responses are summarized in Table 2.6.

	100% Public Funding	Cost-Share (Public & Private)	Privately Funded (Owner or Company)
<b>Home Defensibility Projects →</b>	21%	38%	41%
<b>Community Defensibility Projects →</b>	55%	36%	9%
<b>Infrastructure Projects Roads, Bridges, Power Lines, Etc. →</b>	79%	12%	9%

We wish to thank all Okanogan County residents for completing and returning these surveys.


### 2.4.3 Public Meetings

Public meetings were scheduled in a variety of communities in Okanogan County during the hazard assessment phase of the planning process. Public meetings were scheduled to share information on the planning process, inform details of the hazard assessments, and discuss potential mitigation treatments. Attendees at the public meetings were asked to give their impressions of the accuracy of the information generated and provide their opinions of potential treatments.

The initial schedule of public meetings included five locations in the County and were attended by a number of individuals on the committee and from the general public. Total attendance was as follows: 2 in Twisp on August 22<sup>nd</sup>, 8 in Tonasket on August 23<sup>rd</sup>, 7 in Okanogan on August 23<sup>rd</sup>, and 0 in both Brewster and Nespelem on August 24<sup>th</sup>. The public meeting announcement sent to the local newspapers, local radio stations, fire district representatives, and distributed by committee members is included below in Figure 2.3. The committee also set up a booth at the Okanogan County Fair in September in conjunction with Washington State Department of Natural Resources, the Bureau of Indian Affairs, the USDA Forest Service, and Northwest Management, Inc. This afforded a great opportunity to interact with the public, provide wildfire education materials, and gather comments on the CWPP planning process.

Figure 2.2. Public meeting announcement for August 2006 meetings.

## Okanogan County, Washington Community Wildfire Protection Plan and All Hazard Mitigation Plan **Public Meetings!**



**Twisp Senior Center:** Tuesday, August 22nd, 6:00 PM, Refreshments Provided

**Tonasket Senior Center:** Wednesday, August 23rd, 12:00 PM, Lunch Served

**Okanogan, Commissioner's Hearing Room:** Wednesday, August 23rd, 6:00 PM, Refreshments

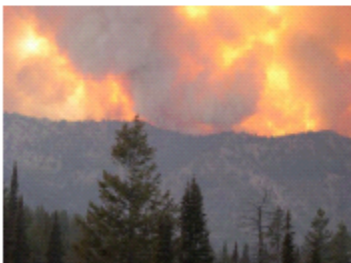
**Brewster, Columbia Steak House:** Thursday, August 24th, 12:30 PM, Refreshments

**Nespelem, Tribal Longhouse:** Thursday, August 24th, 6 PM, Refreshments Provided


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These public meetings will address the All Hazards Mitigation Plan and Community Wildfire Mitigation Plan for our communities. These meetings are open to the public and will include slideshow presentations from hazard mitigation specialists working on the Okanogan County All-Hazards Mitigation Plan and Community Wildfire Protection Plan. Public input is being sought in order to better frame the County's efforts of hazard mitigation treatments, resource enhancements, and preparedness.

Each meeting will last for approximately 1.5 hours.  
*Please attend and participate!*



Learn about the assessments of wildfire, flood, landslides, earthquake, severe weather, and terrorism/civil unrest in Okanogan County. Discuss YOUR priorities for how our communities can best mitigate these risks.






For more information on the All Hazard Mitigation Plan or Community Wildfire Protection Plan projects in Okanogan County, contact the Okanogan County Emergency Management Coordinator, Scott Miller at (509) 422-7207 or William Schlosser at Northwest Management, Inc. (208) 863-4488.

The following slideshow was presented at each of the public meetings by Tera King of Northwest Management, Inc. In addition, where possible, a fire district or other planning committee representative opened the meeting with a brief introduction and, in some cases, a slideshow of local pictures and a narration of recent fires, vegetation changes, and forest health issues in Okanogan County.

Table 2.7. Public meeting slide show.


Slide 1

### Okanogan County, Washington

*Multi-Hazards Mitigation Plan*

**Northwest Management, Inc.**  
Tera R. King, B.S.  
William E. Schlosser, Ph.D.  
233 East Palouse River Drive  
Moscow, Idaho 83843  
208-863-4488 Telephone



August 2006 Okanogan County, Washington

Slide 2



### Northwest Management, Inc.


- Serving the Western U.S. since 1984
- Main Office in Moscow, Idaho
  - Deer Park, Washington
  - Hayden, Idaho
  - Helena, Montana
- Natural Resource Consultants

*Providing a balanced approach to natural resource management*

Slide 3

### FEMA Multi-Hazard Mitigation Plan

- Wildland Fire
- Flooding
- Earthquakes
- Landslides
- Severe Weather
  - Winter Storms, Drought, Wind, Tornadoes, Thunderstorms
- Terrorism and Civil Unrest




**Each Hazard is one Chapter of the AHMP**  
*Required by November 1, 2004 for all counties*

Slide 4

### What is Hazard Mitigation Planning?


- Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. The primary purpose of mitigation planning is to systematically identify policies, actions, and tools that can be used to implement those actions.



Slide 5


### Planning Guidelines

- Federal Emergency Management Agency (FEMA)
- Healthy Forests Restoration Act (HFI)
- National Fire Plan (NFP)



Slide 6

### FEMA Requirements



- Adoption by Local Government Body
- Multi-Jurisdictional Planning
- Identification of Hazards & Risk Assessment
  - Profiling Hazard Events
  - Mapping Juxtaposition of Hazards, Structures, Infrastructure
  - Potential Dollar Losses to Vulnerable Structures (B/C Analysis)
- Documented Planning Process
- Assessing Vulnerability
- Mitigation Goals
- Analysis of Mitigation Measures
- Monitoring, Evaluating & Updating the Plan (5 year cycles)
- Implementation Through Existing Programs
- Public Involvement

Slide 7



Slide 8

### Planning is Committee Based

- Shared Vision and Goals
- Risk Assessments
  - Map (GIS) Based Assessments
  - Observation Based Assessments (community assessments)
  - Local Knowledge Based Assessments
- Wildland-Urban Interface & Significant Infrastructure determination
- Development of Treatment Projects
  - Policy Actions
  - Home Defensibility Projects
  - Infrastructure Treatments
  - Resources and Capability Enhancements
  - Regional Land Management Recommendations

Slide 9



Slide 10

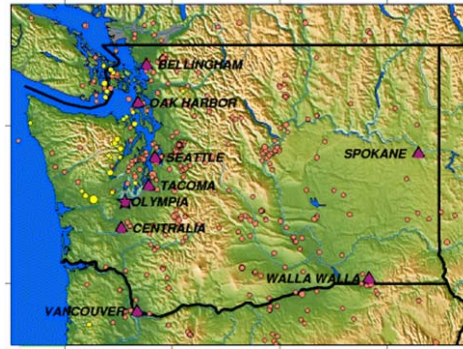




Slide 11



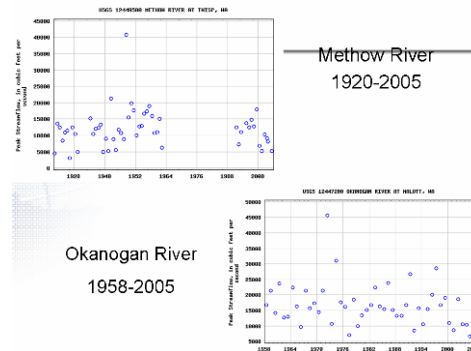
Slide 12



Slide 13



Slide 14



Slide 15

### Preparedness

- Emergency Services
- Fire Protection
- Weather Impacts
- Flood Protection/Programs
- Terrorism Defenses
- Earthquake & Landslide Readiness
- Hospital Protection
- PUD Readiness

Slide 16

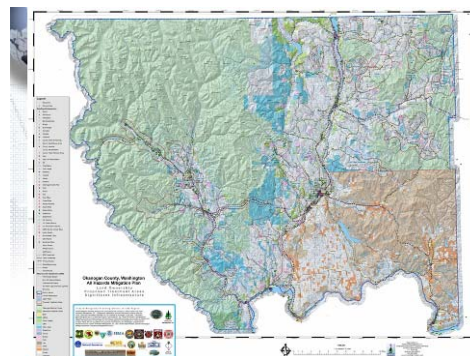


Slide 17


### Types of Projects

- Defensible Space
  - Thinning, pruning, mowing, construction materials, types of landscaping, wood piles, propane tanks, awareness, etc.
- Roadside Fuels Treatments
- Floodplain Management/Policies
- Slope Stabilization
- Access Issues
  - Bridges, turnouts, road width, turnarounds, overhangs, etc.
- Emergency Response Needs
  - Training, equipment, recruitment, PPEs, etc.
- Policy Issues
  - Building codes, road restrictions, public education, etc.

Slide 18




Slide  
19



### Public Involvement

- Press Releases about planning efforts
- Informational posters
- Public Mail Survey was sent to about 400 households in the county – 46% Response Rate
- Public Meetings X5
- Public Review of the DRAFT Plans will be facilitated once all sections have been completed and reviewed by the committee

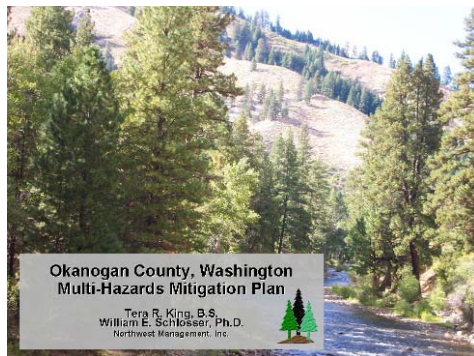
Slide  
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### Your Input

- Maps on the Walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!
- Thank you for attending and participating! Please visit with us.

Slide  
21



#### 2.4.4 Documented Review Process

Review and comment on these plans has been provided through a number of avenues for the committee members as well as the members of the general public.

During regularly scheduled committee meetings in 2006, the committee met to discuss findings, review mapping and analysis, and provide written comments on draft sections of the document. During the public meetings attendees observed map analyses, photographic collections, discussed general findings from the community assessments, and made recommendations on potential project areas.

The first draft of the document was prepared after the public meetings and presented to the committee on August 30<sup>th</sup>, 2006, for a full committee review. The draft document was released for public review on November 1<sup>st</sup>, 2006. The public review period remained open until December 1<sup>st</sup>, 2006.

#### 2.4.5 Continued Public Involvement

Okanogan County is dedicated to involving the public directly in review and updates of this Community Wildfire Protection Plan. The Okanogan County Commissioners, through the Community Wildfire Protection Plan committee, are responsible for the annual review and update of the plan as recommended in the “Administration and Implementation Strategy” section of this document.

The public will have the opportunity to provide feedback about the Plan annually on the anniversary of the adoption of this plan at a meeting of the County Commissioners. Copies of the Plan will be kept at the Okanogan County Sheriff’s Office. The Plan also includes the address and phone number of the County Emergency Manager, responsible for keeping track of public comments on the Plan.

A public meeting will also be held as part of each annual evaluation or when deemed necessary by the Community Wildfire Protection Plan committee. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the Plan. The County Commissioner's Office will be responsible for using County resources to publicize the annual public meetings and maintain public involvement through the County webpage and newspapers.

## Chapter 3: Okanogan County Characteristics

### 3 Background and Area Description

#### 3.1 Demographics

Okanogan County reported an increase in total population from 33,350 in 1990 to 39,564 in 2000 with approximately 15,018 households. Okanogan County has thirteen incorporated communities, Okanogan (pop. 2,483), Omak (pop. 4,721), Oroville (pop. 1,653), Tonasket (pop. 994), Twisp (pop. 938), Brewster (pop. 2,189), Pateros (pop. 643), Conconully (pop. 185), Riverside (pop. 348), and Winthrop (pop. 349). The incorporated communities of Nespelem (pop. 212), Elmer City (pop. 267) and Coulee Dam (pop. 915 in Okanogan County) are within the Reservation boundaries (U.S. Census Bureau 2000).

Table 3.1 summarizes some relevant demographic statistics for Okanogan County.

**Table 3.1. Selected demographic statistics for Okanogan County, Washington, from Census 2000.**

Subject	Number	Percent
<b>Total population</b>	<b>39,564</b>	<b>100.0</b>
GENDER AND AGE		
Male	19,646	49.7
Female	19,918	50.3
Under 5 years	2,513	6.4
5 to 9 years	3,055	7.7
10 to 14 years	3,349	8.5
15 to 19 years	3,026	7.6
20 to 24 years	1,795	4.5
25 to 34 years	4,407	11.1
35 to 44 years	5,840	14.8
45 to 54 years	5,920	15.0
55 to 59 years	2,179	5.5
60 to 64 years	1,911	4.8
65 to 74 years	3,077	7.8
75 to 84 years	1,860	4.7
85 years and over	632	1.6
Median age (years)	38.4	(X)
18 years and over	28,621	72.3
Male	14,143	35.7
Female	14,478	36.6
21 years and over	27,182	68.7
62 years and over	6,764	17.1
65 years and over	5,569	14.1
Male	2,581	6.5

**Table 3.1. Selected demographic statistics for Okanogan County, Washington, from Census 2000.**

Subject	Number	Percent
Female	2,988	7.6
RELATIONSHIP		
Population	39,564	100.0
In households	38,713	97.8
Householder	15,018	38.0
Spouse	8,333	21.1
Child	11,483	29.0
Own child under 18 years	9,652	24.4
Other relatives	1,767	4.5
Under 18 years	851	2.2
Nonrelatives	2,112	5.3
Unmarried partner	1,117	2.8
In group quarters	851	2.2
Institutionalized population	412	1.0
Noninstitutionalized population	439	1.1
HOUSEHOLDS BY TYPE		
Households	15,018	100.0
Family households (families)	10,616	70.7
With own children under 18 years	5,081	33.8
Married-couple family	8,151	54.3
With own children under 18 years	3,443	22.9
Female householder, no husband present	1,611	10.7
With own children under 18 years	1,115	7.4
Nonfamily households	4,402	29.3
Householder living alone	3,678	24.5
Householder 65 years and over	1,413	9.4
Households with individuals under 18 years	5,519	36.7
Households with individuals 65 years and over	5,264	35.1
Average household size	2.58	(X)
Average family size	3.03	(X)
HOUSING TENURE		
Occupied housing units	15,027	100.0
Owner-occupied housing units	10,309	68.6
Renter-occupied housing units	4,718	31.4
Average household size of owner-occupied unit	2.55	(X)
Average household size of renter-occupied unit	2.64	(X)

### 3.2 Socioeconomics

Okanogan County had a total of 15,027 occupied housing units and a population density of 7.5 persons per square mile reported in the 2000 Census. Ethnicity in Okanogan County is



distributed: white 75.3%, black or African American 0.3%, American Indian or Alaskan Native 11.5%, Asian 0.4%, Hispanic or Latino 14.4%, two or more races 2.8%, and some other race 2.2%.

Specific economic data for individual communities is collected by the US Census; in Okanogan County this information is limited to the incorporated cities. City of Oroville households earn a median income of \$22,301 annually, Tonasket earns \$23,523, Conconully earns \$23,214, Nespelem earns \$30,000, and Elmer City earns \$32,500. Coulee Dam residents earn a median annual income of \$37,391, Riverside earns \$23,125, Omak earns \$24,089, Okanogan earns \$26,994, and Brewster earns \$21,556. Pateros, Twisp, and Winthrop earn a median annual income of \$30,938, \$26,354, and \$25,417, respectively. The Okanogan County median income during the same period was \$29,726. Table 3.2 shows the dispersal of households in various income categories in Okanogan County.

Table 3.2. Income in 1999.	Okanogan County	
	Number	Percent
<b>Families</b>	<b>10,616</b>	<b>100.0</b>
Less than \$10,000	919	8.7
\$10,000 to \$14,999	935	8.8
\$15,000 to \$24,999	1,792	16.9
\$25,000 to \$34,999	1,660	15.6
\$35,000 to \$49,999	2,164	20.4
\$50,000 to \$74,999	1,831	17.2
\$75,000 to \$99,999	797	7.5
\$100,000 to \$149,999	314	3.0
\$150,000 to \$199,999	108	1.0
\$200,000 or more	96	0.9
Median family income (dollars)	35,012	(X)

(Census 2000)

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to identify and address any disproportionately high adverse human health or environmental effects of its projects on minority or low-income populations. In Okanogan County, a significant number, 16%, of families are at or below the poverty level (Table 3.3).

Table 3.3. Poverty Status in 1999 (below poverty level).	Okanogan County	
	Number	Percent
<b>Families</b>	<b>1,697</b>	<b>(X)</b>
Percent below poverty level	(X)	16.0
With related children under 18 years	1,322	(X)
Percent below poverty level	(X)	24.3
With related children under 5 years	660	(X)
Percent below poverty level	(X)	33.8
<b>Families with female householder, no husband present</b>	<b>690</b>	<b>(X)</b>
Percent below poverty level	(X)	42.8
With related children under 18 years	620	(X)
Percent below poverty level	(X)	50.0

Table 3.3. Poverty Status in 1999 (below poverty level).	Okanogan County	
	Number	Percent
With related children under 5 years	267	(X)
Percent below poverty level	(X)	65.6
<b>Individuals</b>	<b>8,311</b>	<b>(X)</b>
Percent below poverty level	(X)	21.3
18 years and over	5,233	(X)
Percent below poverty level	(X)	18.5
65 years and over	564	(X)
Percent below poverty level	(X)	10.4
Related children under 18 years	2,957	(X)
Percent below poverty level	(X)	28.2
Related children 5 to 17 years	2,103	(X)
Percent below poverty level	(X)	25.9
Unrelated individuals 15 years and over	2,336	(X)
Percent below poverty level	(X)	34.6

(Census 2000)

The unemployment rate was 7.0% in Okanogan County in 1999, compared to 4.4% nationally during the same period. Approximately 16% of the Okanogan County employed population worked in natural resources, with much of the indirect employment relying on the employment created through these natural resource occupations.

Table 3.4. Employment and Industry.	Okanogan County	
	Number	Percent
Employed civilian population 16 years and over	15,368	100.0
<b>OCCUPATION</b>		
Management, professional, and related occupations	4,577	29.8
Service occupations	2,818	18.3
Sales and office occupations	3,402	22.1
Farming, fishing, and forestry occupations	1,463	9.5
Construction, extraction, and maintenance occupations	1,261	8.2
Production, transportation, and material moving occupations	1,847	12.0
<b>INDUSTRY</b>		
Agriculture, forestry, fishing and hunting, and mining	2,464	16.0
Construction	891	5.8
Manufacturing	723	4.7
Wholesale trade	675	4.4
Retail trade	1,756	11.4
Transportation and warehousing, and utilities	700	4.6
Information	277	1.8
Finance, insurance, real estate, and rental and leasing	474	3.1
Professional, scientific, management, administrative, and waste management services	793	5.2
Educational, health and social services	3,368	21.9

<b>Table 3.4. Employment and Industry.</b>	<b>Okanogan County</b>	
	<b>Number</b>	<b>Percent</b>
Arts, entertainment, recreation, accommodation and food services	1,325	8.6
Other services (except public administration)	796	5.2
Public administration	1,126	7.3

(Census 2000)

Approximately 61% of Okanogan County's employed persons are private wage and salary workers, while around 26% are government workers (Table 3.5).

<b>Table 3.5. Class of Worker.</b>	<b>Okanogan County</b>	
	<b>Number</b>	<b>Percent</b>
Private wage and salary workers	9,391	61.1
Government workers	4,000	26.0
Self-employed workers in own not incorporated business	1,834	11.9
Unpaid family workers	143	0.9

(Census 2000)

### 3.2.1 Description of Okanogan County

*Information adapted from the Okanogan County Comprehensive Plan.*

Okanogan means "rendezvous" and refers to the place where the Okanogan River joins the Columbia River. The Washington Territorial Legislature created the County on February 2, 1888.

The total area of Okanogan County is approximately 3,400,000 acres, of which 953,301 acres is privately owned and about 1,574,262 acres is federally owned. Over 95 percent of the federally owned land is encompassed within the jurisdiction of the United States Forest Service, primarily within the Okanogan National Forest, most of the Pasayten Wilderness, and portions of the Lake Chelan – Sawtooth Wilderness.

Larger than several states, Okanogan County is bordered on the north by the Canada, on the south by the Columbia River, on the east by Ferry County, and on the west by looming peaks of the North Cascade Mountains. The County covers 5,281 square miles, making it the largest County in Washington. Only 30% of the land within the County is in private ownership due to the amount of state and federal land. The Colville Indian Reservation, located in the southeast corner of the County, occupies approximately 700,000 acres and is an integral part of the heritage of the County.

Forested highlands, shrub covered hills, and valley's with fertile farmlands comprise Okanogan County, which is located east of the Cascades along the Canadian border in the north-central part of Washington. Bordering the County on the west are Whatcom, Skagit, and Chelan Counties, to the east is Ferry County, and to the south is Douglas County. The western half of the County is comprised of dense, rugged, mountainous terrain, much of which is within Okanogan National Forest. Similar topography also can be found in the northeast corner of the County. From the north part of the County, the land descends into rolling hills, grassy ranges, and fertile valleys that extend through the center of the County.

Only 30% of the land within the County is in private ownership due to the amount of state and federal land. The Confederated Tribes of the Colville Reservation) occupies approximately 675,000 acres in the County's southeast corner and is an integral part of the County's heritage.

Government, retail trade, services, and manufacturing are a few of the major employers within the County. Omak, the regional center for services and trade, is experiencing a great deal of growth. There is also increasing commercial development pressure in the area between the Canadian border and Oroville. The City of Coulee Dam is the location of Grand Coulee Dam, one of the largest concrete structures in the world, and largest electricity producer in the United States.

### 3.2.1.1 Land Use

A relatively large percentage of the County is publicly owned. The majority of the property is held either as public property or as Indian lands. Private land is becoming more and more expensive as the population grows and more property is developed. This factor combined with the mountainous nature of the geography is expected to produce significantly higher demands on privately held land in the future.

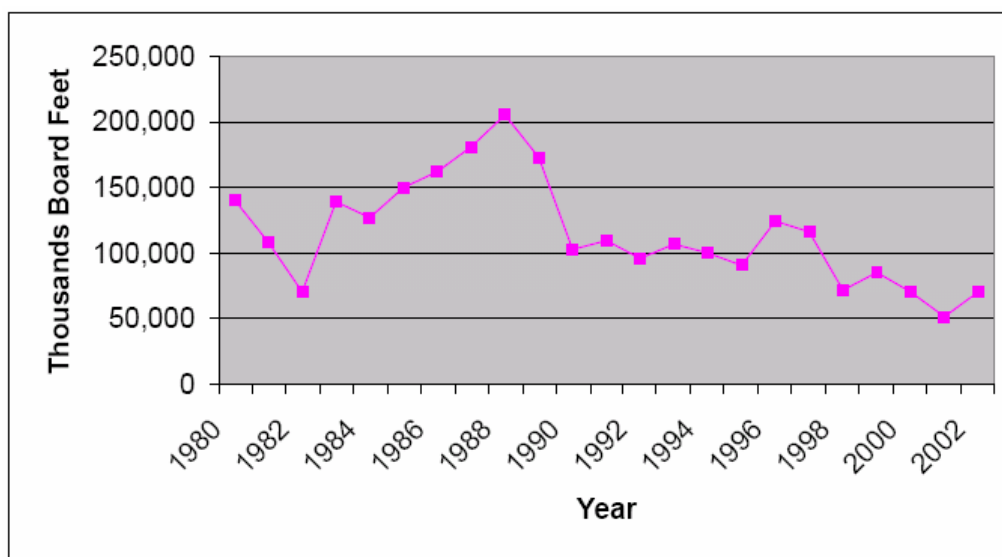
**Table 3.6. Ownership Categories in Okanogan County.**

Land Owner	Acres	Percent
Private	953,301	28%
City	1,343	.04%
County	937	.03%
Public Utility Districts	1,505	.04%
State	357,721	10%
Federal	1,574,262	46%
Tribal	485,695	14%
Water Bodies	36,439	1%
<b>Total</b>	<b>3,411,203</b>	

Approximately 740 square miles (473,215 acres) of privately owned land within the County (not including the Reservation) are potentially suitable for designation as “agricultural land of long-term significance for the production of food or agricultural products”.

A total of 130 square miles (82,265 acres) of privately owned land within the County was identified as forest land. The total acres of timberland harvested in Okanogan County are difficult to obtain for all “ownership” groups, particularly from private timber harvesters. Due to this difficulty, the Washington Department of Natural Resources (DNR) discontinued reporting acreage information in 1987. Instead, DNR provides timber volume data in thousand board feet (MBF)<sup>3</sup>. Figure 3.1 shows the change in total annual timber harvest for Okanogan County between 1980 and 2002, as reported by DNR. It reflects a high point of 205,790 MBF in 1988 and a low of 51,577 MBF in 2001.

**Figure 3.1. Total Annual Timber Harvest for Okanogan County reported by DNR, 1980-2002.**



Total timber harvest in the County represented approximately 2% of the statewide timber harvest and 7% of the total Eastern Washington timber harvest in 2002. Of the total board feet of timber harvested in Okanogan County in 2002, approximately 69% was from tribal and allotted lands. Fewer than 20% of the timber harvested in the County in 2002 was on public lands, including the Okanogan National Forest and State-owned lands managed by DNR.

Approximately 22 square miles of private land in the County has mining activity, or is likely to have it in the future.

### **3.2.1.2 Resource Dependency**

Okanogan County's economy is growing and becoming much more diverse. Along with traditional natural resource industries such as agriculture, timber, and mining, other industries are beginning to play a larger role in the local economy. With the advent of broadband high speed internet, technology companies have strategically located in the Methow Valley and throughout the County. Value added agriculture such as fruit stands and farmers markets, dried fruit and chocolate covered fruit are becoming more prevalent. Several value added Canadian wood product manufacturing companies have set up American subsidiaries to process Canadian timber in the U.S.

### **3.2.1.3 Recreation**

Larger than several states, Okanogan County is bordered on the north by the Canadian Okanogan, on the south and east by the Columbia River Basin and Lake Roosevelt, and on the west by the 10,000 foot peaks of the North Cascade Mountains. Okanogan County offers wide-open spaces containing wildlife, spectacular scenery, and rural charm. It features a diverse blend of snow covered peaks, small towns, western history, art galleries and museums, live theatre, farmers markets and fresh from the field produce stands, music festivals, rodeos, country fairs and two famous dams. The area is dotted with hundreds of lakes, rivers and streams, sunny days and clear, star-filled nights. Throughout Okanogan County, whitewater rafting, boating, fly fishing, hiking, mountain biking, rock climbing, horseback riding, wilderness packing, hunting and more are available from spring through fall. Winter offers cross-country

and downhill skiing, snowboarding and snowmobiling, snowshoeing and dogsledding. A colorful and bustling region, Okanogan County has a rich economic base utilizing its vast natural resources including timber, mining, ranching, recreation, tourism, hydroelectricity and agriculture.

#### **3.2.1.3.1 Okanogan National Forest**

The Okanogan National Forest disproves the widely held notion that Washington State lies flat east of the Cascade Mountains. Forestlands in the northeast corner roll like the high seas. The Okanogan Mountain Ranges is considered to be part of the foothills to the Rocky Mountains. The troughs between the mountains in this area channel water into the Columbia River system.

The rivers in the Okanogan National Forest are following paths carved by Ice Age glaciers. Mile-high ice sheets surging south from Canada drowned all but the tallest peaks several times during the last two million years. The ice ground off sharp edges, leaving many of the mountains well rounded.

Today's landscape emerged from the melting ice about 10,000 years ago. Animals and plants followed the retreating glaciers northward, and humans were not far behind. The first Indians probably began hunting, fishing, and gathering in the area about 9,000 years ago.

#### **3.2.1.3.2 State Parks**

There are five Washington State Parks in Okanogan County: Alta Lake, Fort Okanogan, Pearrygin Lake, Conconully, and Osoyoos Lake. These state parks and other recreation areas offer opportunities for enjoyment and learning. Camping, hiking, biking, boating, windsurfing or rock climbing are just a few of the summer activities available. In winter, cross-country skiing, snowshoeing, and snowmobiling are available.

### **3.3 Cultural Resources**

The United States has a unique legal relationship with Indian tribal governments defined in history, the U.S. Constitution, treaties, statutes, Executive Orders, and court decisions. Since the formation of the union, the United States has recognized Indian tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous regulations that establish and define a trust relationship with Indian tribes.

The relationship between Federal agencies and sovereign tribes is defined by several laws and regulations addressing the requirement of Federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing Federal undertakings, among these are:

- **EO 13175, November 6, 2000**, Consultation and Coordination with Indian Tribal Governments.
- **Presidential Memorandum, April, 1994**. Government-Government Relations with Tribal Governments (Supplements EO 13175). Agencies must consult with federally recognized tribes in the development of Federal Policies that have tribal implications.
- **EO 13007, Sacred sites, May 24, 1996**. Requires that in managing Federal lands, agencies must accommodate access and ceremonial use of sacred sites and must avoid adversely affecting the physical integrity of these sites.
- **EO 12875, Enhancing Intergovernmental Partnerships, October 26, 1993**. Mainly concerned with unfunded mandates caused by agency regulations. Also states the

intention of establishing “regular and meaningful consultation and collaboration with state, local and tribal governments on matters that significantly or uniquely affect their communities.”

- **Native American Graves Protection and Repatriation Act (NAGPRA) of 1989.** Specifies that an agency must take reasonable steps to determine whether a planned activity may result in the excavation of human remains, funerary objects, sacred objects and items of cultural patrimony from Federal lands. NAGPRA also has specified requirements for notifying and consulting tribes.
- **Archaeological Resources Protection Act (ARPA), 1979.** Requires that Federal permits be obtained before cultural resource investigations begin on Federal land. It also requires that investigators consult with the appropriate Native American tribe prior to initiating archaeological studies on sites of Native American origin.
- **American Indian Religious Freedom Act (AIRFA), 1978.** Sets the policy of the US to protect and preserve for Native Americans their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian . . . including, but not limited to access to sacred sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.
- **National Environmental Policy Act (NEPA), 1969.** Lead agency shall invite participation of affected Federal, State, and local agencies and any affected Indian Tribe(s).
- **National Historic Preservation Act (NHPA), 1966.** Requires agencies to consult with Native American tribes if a proposed Federal action may affect properties to which they attach religious and cultural significance. (Bulletin 38 of the act, identification of TCPs, this can only be done by tribes.)
- Treaties (supreme law of the land) in which tribes were reserved certain rights for hunting, fishing and gathering and other stipulations of the treaty.
- Unsettled aboriginal title to the land, un-extinguished rights of tribes.

### **3.3.1 Colville Indian Reservation**

*Summarized from Confederated Tribes of the Colville Reservation at [www.colvilletribes.com](http://www.colvilletribes.com).*

**Total Size:** 1.4 Million Acres (2,100 Square Miles)

**Twelve Bands compose the Confederated Tribes of the Colville Reservation:**

- Wenatchee
- Nespelem
- Moses-Columbia
- Methow
- Colville
- Okanogan
- Palus
- Sanpoil
- Entiat
- Chelan
- Nez Perce
- Lake

**Tribal Enrollment Total:** 8,700

**Physical Characteristics of the Reservation:**

**Topography:** Elevation of the Reservation lands generally increase from South to North and from West to East. Elevations range from 790 feet at the mouth of the Okanogan River to 6,774 feet at the Summit of Moses Mountain. Average elevation of the Reservation is above 3,000 feet.

**Climate:** Summers, on the plains, are sunny, warm and dry with some hot days. During 4 or 5 months, in the lower elevations extreme highs may be 100°F, while, in the higher elevations 1 or 2 months may reach above 90°F. In winter, minimum temperatures of -10° to -20°F are common although a few stations report -25° to -30°F. Normally, precipitation is light in the summer and heaviest in the winter. Valleys and lowlands receive an average of 10 to 14 inches of precipitation; in the mountains, precipitation increases with elevation where 25 to 30 inches per year can be expected on the higher ridges, with the majority occurring as snow. Growing seasons vary from over 180 days in the Southwest to less than 80 days in the forested highlands.

**Geology:** The Reservation lies in a physiographic province called the Okanogan Highlands. A period of compression and uplifting formed the present mountains, however, glacial erosion shaped much of the land to its present form.

**Soils:** The most abundant soil parent materials found on the Reservation are produced by glaciation and water laid glacial out wash. Alluvium and lacustrine sediments are the only materials of major agricultural importance. Most of the soils that are suitable for cultivation occur on the level to undulating alluvial and out wash terraces and in isolated upland areas.

**Vegetation:** The major vegetative cover is divided into two groups; forest and steppe. Forest areas range from open forested grasslands to dense coniferous forests. Dominant species in forested areas are ponderosa pine, Douglas-fir, lodgepole pine, and western larch. Huckleberry, serviceberry, and a number of sub shrubs and roots are as important to Tribal gatherings today, as they were in years past.

**Fish & Wildlife:** Wildlife is plentiful on the Reservation. Deer hunting is open year-round to Tribal members only, and plays an important role as a food source. The Tribal elk herd numbers around 800 with a limited hunting season. Game bird populations and protected predators such as the Bald Eagle and Peregrine Falcon are managed by the Tribal Fish & Wildlife Department. The Sharp Tailed Grouse or Prairie Chicken is an endangered species with nesting and dancing grounds on the Reservation. Although salmon fishing is still an important food source, salmon runs are restricted due to the construction of Grand Coulee and Chief Joseph Dams on the Columbia River. Fishing on the numerous lakes and streams on the Reservation is still enjoyed by many Tribal members. Fishing permits are offered by the Tribal Fish and Wildlife Department.

**History:** The Confederated Tribes of the Colville Reservation is a Sovereign Nation. The Confederated Tribes of the Colville Reservation is a federally recognized American Indian Tribe.

Today, over 9,065 descendants of 12 aboriginal tribes of Indians are enrolled in the Confederated Tribes of the Colville Reservation. The tribes, commonly known by English and French names, are: the Colville, the Nespelem, the Sanpoil, the Lake, the Palus, the Wenatchi (Wenatchee), the Chelan, the Entiat, the Methow, the southern Okanogan, the Moses Columbia and the Nez Perce of Chief Joseph's Band.

Prior to the influx of Canadians and Europeans in the mid-1850's the ancestors of the 12 aboriginal tribes were nomadic, following the seasons of nature and their sources of food. Their



aboriginal territories were grouped primarily around waterways such as the Columbia River, the Sanpoil River, the Okanogan River, the Snake River and the Wallowa River.

Many tribal ancestors traveled throughout their aboriginal territories and other areas in the Northwest (including Canada), gathering with other native peoples for traditional activities such as food harvesting, feasting, trading, and celebrations that included sports and gambling. Their lives were tied to the cycles of nature both spiritually and traditionally.

The Colville Indian Reservation was established by Presidential Executive Order in 1872 and was originally twice as large as it is today.

The Colville Indian Reservation land base covers 1.4 million acres or 2,100 square acres located in North Central Washington, primarily in Okanogan and Ferry counties. The Reservation consists of tribally owned lands held in federal trust status for the Confederated Tribes, land owned by individual Colville tribal members, most of which is held in federal trust status, and land owned by others, described as fee property and taxable by counties.

Colville Reservation lands are diverse with natural resources including standing timber, streams, rivers, lakes, minerals, varied terrain, native plants and wildlife.

The Colville Indian Reservation is occupied by over 5,000 residents, both Colville tribal members and their families and other non-Colville members, living either in small communities or in rural settings. Approximately fifty percent of the Confederated Tribes membership live on or adjacent to the reservation.

The Confederated Tribes and the Colville Indian Reservation are governed by the Colville Business Council.

From its administrative headquarters located at the Bureau of Indian Affairs (BIA) Agency at Nespelem, the Colville Business Council oversees a diverse, multi-million dollar administration that employs from 800 to 1200 individuals in permanent, part-time and seasonal positions.

The Confederated Tribes operates on a yearly budget which is financed primarily from revenues generated from the sale of the Tribes timber products and from other sources including federal, state and private contributions.

The Confederated Tribes adheres to Colville Tribal Member Preference. Both Colville tribal members and non-Colville members are employed throughout its extensive governmental operation.

This governmental operation provides a variety of services for Colville tribal members living on the reservation and elsewhere, and for the management of reservation natural resources.

In addition, the Confederated Tribes have chartered its own corporation, the Colville Tribal Enterprise Corporation (CTEC), which oversees several enterprise divisions including a gaming division and three casinos. The Corporation employs several hundred permanent and part-time employees. The work force is composed primarily of Colville tribal members and non-tribal members from the communities where the enterprises are located.

Numerous chronic situations affect the daily lives of Colville tribal members such as high unemployment on the Colville Indian Reservation and lack of employment opportunities for much of the available labor force. Individuals and families suffer from the effects of extensive drug and alcohol abuse, domestic violence and crime.

In many instances, Colville Indian families are living below the national poverty standards year after year and depend on the Confederated Tribes and other aid systems to survive.

Colville Indian Reservation communities lack adequate, affordable housing, home water systems and even electricity. Safe, usable roadways throughout the reservation are lacking as well as facilities such as modern health clinics and youth shelters.

Confederated Tribes strive to protect and enhance the quality of life for Colville tribal members and at the same time, govern as a sovereign nation.

### 3.3.2 National Register of Historic Places

The National Park Service maintains the National Register of Historical Places as a repository of information on significant cultural locale. These may be buildings, roads or trails, places where historical events took place, or other noteworthy sites. The NPS has recorded sites in its database. These sites are summarized in Table 3.7.

Table 3.7. National Register of Historic Places in Okanogan County, Washington.					
Item Number	Resource Name	Address	City	Listed	Architect, builder, or engineer
1	Bonaparte Mountain Cabin	East of Tonasket in National Forest	Tonasket	1981	
2	Chief Joseph Memorial	Near jct. of WA 10A and Cache Creek Road	Nespelem	1974	
3	Columbia River Bridge	WA 17 at Bridgeport	Bridgeport	1995	
4	Early Winters R. S. Work Center	Okanogan N.F.	Winthrop	1986	CCC, USDA Forest Service
5	Enloe Dam and Powerplant	4 mi West of Oroville	Oroville	1978	
6	Fort Okanogan	N of Bridgeport between Columbia & Okanogan Rivers	Bridgeport	1973	
7	Grand Coulee Bridge	Spans Columbia River	Grand Coulee	1982	Washington Dept. of Highways
8	Lost Lake Guard Station	Okanogan N. F.	Tonasket	1986	CCC, USDA Forest Service
9	Okanogan County Courthouse	149 N Third Ave	Okanogan	1995	Davenport, D.D., Keith, George H.
10	Okanogan Project: Conconully Reservoir Dam	S of Conconully	Conconully	1974	
11	Parson Smith Tree	40 mi N of Winthrop on the Canadian border in Okanogan N. F.	Winthrop	1974	
12	Hiram F. Smith Orchard	2 mi N of Oroville on Osoyoos Lake	Oroville	1975	Smith, Hiram F.
13	US Post Office-Okanogan Main	212 Second Ave. N	Okanogan	1991	Simon, Louis A.
14	US Post Office-Omak Main	104 S. Main St.	Omak	1991	Simon, Louis A.
15	Guy Waring Cabin	285 Castle Ave.	Winthrop	1982	Waring, Guy

(NRHP 2003)

Fire mitigation activities in and around these sites has the potential to affect historic places. In all cases, the fire mitigation work will be intended to reduce the potential of damaging the site due to wildfire. Areas where ground disturbance will occur will need to be inventoried depending

on the location. Ground-disturbing actions may include, but are not limited to, constructed fire lines (hand line, mechanical line, etc.), new roads to creeks to fill water tankers, mechanical treatments, etc. Only those burn acres that may impact cultural resources that are sensitive to burning (i.e., buildings, peeled bark trees, etc.) would be examined. Burns over lithic sites are not expected to have an impact on those sites, as long as the fire is of low intensity and short duration. Some areas with heavy vegetation may need to be examined after the burn to locate and record any cultural resources although this is expected to be minimal. Traditional Cultural Properties (TCPs) will also need to be identified. Potential impact to TCPs will depend on what values make the property important and will be assessed on an individual basis.

### 3.4 *Transportation & Infrastructure*

The transportation system within the County is comprised of a significant number of roads, several airports, a rail line and an extensive trail system. The road system is comprised of state highways, Washington State Department of Natural Resources (DNR) roads, County roads, USFS or BIA roads, and private roads. USFS roads constitute the most miles of road, followed by County roads. Roads are important in the wildland urban interface, because they provide a means of escape and access to fight fires, and because they may act as barriers to the spread of a fire.

**Table 3.8. Roads within the County by Ownership.**

<b>Jurisdiction</b>	<b>Miles in County</b>
Washington State Highways	288
DNR, Private, BIA	1,378
County	1,425
Forest Service	2,209
<b>Total</b>	<b>5,300</b>

Almost all of the roads in the County were originally built to facilitate logging and farming activities. As such, these roads can support timber harvesting equipment, logging trucks, and firefighting equipment referenced in this document. However, many of the new roads have been built for home site access, especially for new subdivisions. In most cases, these roads are adequate to facilitate firefighting equipment as they adhere to County road standards. County road standards and building guidelines for new developments should be adhered to closely to insure this tendency continues.

Transportation networks in the County have been challenged because a number of communities have only one, two, or three access points suitable for use during an emergency. The community of Winthrop is a prime example. Other communities that may be at risk because of limited access include Mazama, Carlton, Methow, Riverside, Molson, Chesaw, Oroville, Elmer City, Coulee Dam, Nespelem, and Loomis.

Access routes were identified by committee members and amended by the public during public meetings. These routes identify the primary access into and out of the County that are relied on during emergencies. As such, they often receive prioritized treatment when allocating resources for hazard abatement. There are 311 miles of primary access routes and 441 miles of secondary access routes identified in Okanogan County.

Okanogan County has both significant infrastructure and unique ecosystems within its boundaries. Of note for this Community Wildfire Protection Plan are the existence of US 97, State Routes 20, 153, and 155, and the presence of high tension power lines supplying most communities in Okanogan and Ferry Counties.

The Public Utilities District power line corridor over Loup Loup Pass is particularly critical to the County due to the fact that if it were compromised, the Methow Valley residents north of Carlton would be without power. There is a distribution power line running up the Methow Valley from Pateros; however, this line is not adequate to supply Twisp with even limited power. Communities north of Twisp such as Winthrop and Mazama would be completely without power for an extended period of time if the Loup Loup Pass power line went down.

### 3.4.1 Communication Sites and Lookouts

Included in the assessment of critical infrastructure is the location of lookouts, repeater towers, and other communication sites. Known items were identified in the County and are summarized in Table 3.9.

<b>Table 3.9. Lookouts, Repeater Towers, and Communication Site Locations.</b>		
<b>Name</b>	<b>UTM_X</b>	<b>UTM_Y</b>
<b>Radio Towers</b>		
Pitcher Mtn.	705388.4	146329.7
Early Winters	638940.0	177940.9
Sweetgrass	648638.9	185721.8
Okanogan	701321.0	151764.8
Whitestone	711890.5	194021.6
Goat Peak	641346.5	181580.0
Harts Pass	621732.6	191411.3
Slate Peak	620930.8	193635.7
Monument 83	623427.6	222388.2
First Butte	663099.0	180299.3
North Twenty Mile	665949.0	195005.2
Winthrop	657323.1	164667.6
NCSB	660578.2	158803.2
Twisp	662576.3	151611.5
McClure Mtn.	662909.8	146716.1
McClure Mtn. 2	663024.4	146826.0
Leecher Mtn.	671439.1	139387.1
Lookout Mtn.	657582.4	146230.0
Knowlton Knob	678991.3	129854.4
Funk Mtn.	690001.9	178455.6
Conconully	689555.9	174156.3
Buck Mtn.	684375.6	160224.8
Omak Tanker Base	707019.4	163036.2
Tunk Mtn.	727605.3	173103.4
Tonasket	712178.4	190335.0
Bonaparte	735414.5	199918.7
Lost Lake	740456.7	207456.7
<b>RAWS Towers</b>		
First Butte	2175933.8	591410.1
Leecher	2202540.5	457422.9
Lost Lake	2426094.8	686691.2
NCSB	2168105.5	520560.1

**Table 3.9. Lookouts, Repeater Towers, and Communication Site Locations.**

<b>Name</b>	<b>UTM_X</b>	<b>UTM_Y</b>
Washington Pass	2044428.3	556339.0
Douglas-Ingram	2178402.2	407929.7
Monument 83	2044020.7	727451.4
Starvation	2216968.2	557548.2
Peony	2392111.2	585587.0
Stehekin	2032454.7	474231.8
<b>Cell Towers</b>		
Aeneas	2291887.2	638120.8
Fox Mtn.	2274975.6	485752.2
Olive Mtn.	2319839.0	548321.8
Olive Mtn.	2319808.8	548543.6
Aeneas	2292214.8	638201.5
Goat Mountain electronic site	2207514.3	371315.7
Goat Mountain electronic site	2207624.7	371205.3
Goat Mountain electronic site	2207801.2	371124.4
Goat Mountain electronic site	2207926.2	371139.1
Goat Mountain electronic site	2208043.9	371278.9
Goat Mountain electronic site	2208029.2	371403.9
Goat Mountain electronic site	2207977.7	371565.8
Tunk Mtn. Electronic Site	2386897.1	568085.0
Tunk Mtn. Electronic Site	2387213.1	568099.4
Tunk Mtn. Electronic Site	2386925.8	567754.6
Tunk Mtn. Electronic Site	2387126.9	567510.4
McClure Mtn. Electronic Site	2175038.9	481385.8
McClure Mtn. Electronic Site	2175367.4	481618.2
Grizzly Mtn. Electronic Site	2127600.5	565884.5
Little Buck Mtn. Electronic Site	2220423.2	507572.5
Flagg Mtn. Electronic Site	2108678.4	583741.3
Granit Pass 14 miles W of Mazama, Wa	2036006.1	570924.7
1 mi E Coulee Dam , Wa	2458420.8	356085.1
Moses Mtn. 10 mi W of Disautel, Wa	2430588.9	505357.0
Goat Peak 6 mi SW of Pateros, Wa	2104424.6	596232.3
9 <sup>th</sup> & C St. Nespelem, Wa	2453306.6	431221.8
9 <sup>th</sup> & C St. Nespelem, Wa	2447369.1	434915.5
Patrol Ave. Okanogan, Wa	2306146.9	499475.7
	2314989.6	484032.4
618 Okoma Drive	2314838.2	514174.0
OK05-O	2369818.0	532322.4
OK07-O	2349662.0	656181.1
95-1	2349943.3	656230.6
OK09-0	2207127.2	379331.5
OK11-O	2175097.0	481771.4
OK13-O	2314742.3	483999.4
OK14-0	2334713.3	713023.3

**Table 3.9. Lookouts, Repeater Towers, and Communication Site Locations.**

<b>Name</b>	<b>UTM_X</b>	<b>UTM_Y</b>
143-O	2319650.2	548370.8
150 Dyer Hill	2272527.7	383516.1
303 Republic Mod Cell	2508371.6	617001.4

### 3.5 Vegetation & Climate

Vegetation in Okanogan County is a mix of forestland and agricultural ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The full extent of the County was evaluated for cover type by the USDA Forest Service in 2001 as determined from Landsat 7 ETM+ imagery in tabular format.

The most represented vegetated cover type is Douglas-fir at approximately 18% of the total area. The next most common vegetation cover types represented are a Herbacious at 16%, Shrub at 14%, Subalpine Forest Mix at 9%, and Ponderosa Pine at 9%. Urban areas and agriculture represents approximately 4.3% of the total area (Table 3.10).

**Table 3.10. Vegetative Cover Types in Okanogan County.**

<b>Cover</b>	<b>Acres</b>	<b>Percent</b>
Agriculture	140,819	4.1%
Burned Areas	13,372	0.4%
Deciduous	41,797	1.2%
Douglas-fir	617,979	18.2%
Englemann Spruce	26,871	0.8%
Herbacious	555,344	16.3%
Lodgepole Pine	244,267	7.2%
Low Canopy Closure Tree	44,811	1.3%
Moist Mixed Forest	4,833	0.1%
Mountain Hemlock	1,058	0.0%
Conifer/Deciduous Mixed	7,575	0.2%
Pacific Silver Fir	1,889	0.1%
Ponderosa Pine	291,774	8.6%
Ponderosa Pine/Douglas-fir	193,040	5.7%
Rock	139,852	4.1%
Shrub	461,886	13.6%
Snow	13,187	0.4%
Subalpine Fir	37,474	1.1%
Subalpine Forest Mix	317,536	9.3%
Subalpine Larch	14,895	0.4%
Urban	5,174	0.2%
Dry Mixed Forest	116,988	3.4%
Water	33,090	1.0%
Western Larch	34,355	1.0%
Whitebark Pine	41,385	1.2%
<b>Total</b>	<b>3,401,252</b>	<b>100.0%</b>

Vegetative communities within the County follow the strong moisture and temperature gradient related to the major drainages. As moisture availability increases, so does the abundance of conifer species, with subalpine forest communities present in the highest elevations where precipitation and elevation provide more moisture during the growing season.

### 3.5.1 Monthly Climate Summaries in Okanogan County

#### 3.5.1.1 Coulee Dam

Period of Record Monthly Climate Summary

Period of Record : 6/ 1/1948 to 12/31/2005

**Table 3.11. Monthly climate records for Coulee Dam, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	32.1	39.8	50.2	61.2	70.4	78.5	86.8	85.8	76.4	60.9	43.6	34.0	60.0
Average Min. Temperature (F)	21.4	25.8	31.2	38.1	45.6	52.6	58.1	57.5	50.1	40.2	31.4	24.3	39.7
Average Total Precipitation (in.)	1.12	0.91	0.86	0.79	1.13	0.90	0.52	0.48	0.50	0.66	1.28	1.48	10.62
Average Total SnowFall (in.)	6.5	2.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	5.1	16.1
Average Snow Depth (in.)	2	1	0	0	0	0	0	0	0	0	0	1	0

Percent of possible observations for period of record. Max. Temp.: 98.7% Min. Temp.: 98.8% Precipitation: 98.7% Snowfall: 92.4% Snow Depth: 90.6%

#### 3.5.1.2 Methow, Washington

Period of Record Monthly Climate Summary

Period of Record: 6/ 2/1948 to 10/31/1986

**Table 3.12. Monthly climate records for Methow, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	31.9	39.9	52.8	63.5	72.1	79.7	88.0	88.2	78.3	63.1	43.5	31.9	61.1
Average Min. Temperature (F)	16.8	21.4	28.5	34.8	42.2	48.4	53.6	52.8	43.8	33.4	25.7	17.2	34.9
Average Total Precipitation (in.)	1.48	1.29	1.13	0.81	1.11	0.86	0.46	0.57	0.54	0.73	1.77	2.00	12.76
Average Total SnowFall (in.)	11.5	5.8	2.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	4.1	16.6	40.8
Average Snow Depth (in.)	10	8	2	0	0	0	0	0	0	0	1	6	2

Percent of possible observations for period of record. Max. Temp.: 98.7% Min. Temp.: 98.7% Precipitation: 98.9% Snowfall: 92.8% Snow Depth: 95.9%

#### 3.5.1.3 Omak, Washington

Period of Record Monthly Climate Summary

Period of Record : 1/ 1/1931 to 12/31/2005

**Table 3.13. Monthly climate records for Omak, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	30.4	38.4	51.3	63.4	72.7	79.7	87.1	85.6	76.3	61.5	43.0	33.5	60.2
Average Min. Temperature (F)	17.3	21.8	29.0	36.2	43.6	50.4	55.4	54.1	45.6	35.5	27.4	21.6	36.5
Average Total Precipitation (in.)	1.34	1.15	0.88	0.95	0.97	1.15	0.58	0.51	0.54	0.90	1.39	1.84	12.21
Average Total SnowFall (in.)	7.4	4.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	8.9	23.5
Average Snow Depth (in.)	7	4	1	0	0	0	0	0	0	0	0	3	1

Percent of possible observations for period of record. Max. Temp.: 79.7% Min. Temp.: 79.4% Precipitation: 81% Snowfall: 69.4% Snow Depth: 74.4%

### 3.5.1.4 Tonasket, Washington

Period of Record Monthly Climate Summary

Period of Record : 7/ 1/1984 to 9/30/2004

**Table 3.14. Monthly climate records for Tonasket, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	33.9	41.3	54.4	65.2	72.9	79.9	87.2	86.1	76.6	61.0	43.6	33.0	61.3
Average Min. Temperature (F)	22.7	24.9	30.8	37.5	43.8	49.8	54.4	53.3	45.0	35.5	28.6	22.9	37.4
Average Total Precipitation (in.)	1.01	0.89	0.70	0.84	1.41	1.38	0.71	0.60	0.50	0.74	1.20	1.44	11.43
Average Total SnowFall (in.)	4.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	6.0	13.9
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 99.4% Min. Temp.: 99.3% Precipitation: 96.8% Snowfall: 94% Snow Depth: 82.6%

### 3.5.1.5 Mazama, Washington

Period of Record Monthly Climate Summary

Period of Record : 4/ 5/1950 to 12/31/2005

**Table 3.15. Monthly climate records for Mazama, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	28.7	36.5	46.4	57.6	67.0	74.5	82.3	82.5	72.8	56.8	37.9	27.8	55.9
Average Min. Temperature (F)	13.6	17.7	24.8	31.4	39.7	46.7	51.6	50.6	41.7	31.8	23.7	14.4	32.3
Average Total Precipitation (in.)	3.84	2.45	1.70	1.04	1.00	1.02	0.69	0.73	0.81	1.61	3.34	4.12	22.35



**Table 3.15. Monthly climate records for Mazama, Okanogan County, Washington.**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Total SnowFall (in.)	36.0	19.6	7.8	0.3	0.0	0.0	0.0	0.0	0.0	1.8	16.3	40.0	121.8
Average Snow Depth (in.)	27	30	20	2	0	0	0	0	0	0	3	16	8

Percent of possible observations for period of record. Max. Temp.: 63.6% Min. Temp.: 63.6% Precipitation: 67.4% Snowfall: 64% Snow Depth: 63.2%

### 3.6 Ecosystems

Recent forest health assessments of dry ponderosa pine forests in the interior West indicate that fire and insect disturbance regimes and concomitant changes in stand and landscape characteristics have been significantly altered. These altered forest are increasingly susceptible to catastrophic fire events such as the 1988 55,000 acre Dinkleman Burn (Washington), the 1994 250,000 acre Foothill Burn (Idaho), and the 1994 140,000 acre Tyee Burn (Washington). These burns are characterized as catastrophic because they are outside the range of variability in burn intensity and extent of historical burns that occurred on these sites before Euro-settlement. Severe burns have the potential to adversely impact biological capacity and biological integrity of affected watersheds (Everett et al 1996).

Okanogan County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. A century of wildland fire suppression coupled with past land-use practices (primarily timber harvesting, agriculture, and grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, forests and rangelands in Okanogan County have become more susceptible to large-scale, high intensity fires posing a threat to life, property, and natural resources including wildlife and special status plant populations and habitats. High-intensity, stand-replacing fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large high intensity fires throughout the nation's forest and rangelands, has resulted in significant safety risks to firefighters and higher costs for fire suppression (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

### 3.7 Hydrology

The Washington Department of Ecology & Water Resources Program is charged with the development of the Washington State Water Plan. Included in the State Water Plan are the statewide water policy plan, and component basin and water body plans which cover specific geographic areas of the state (WDOE 2005). The Washington Department of Ecology has prepared General Lithologies of the Major Ground Water Flow Systems in Washington.

The state may assign or designate beneficial uses for particular Washington water bodies to support. These beneficial uses are identified in section WAC 173-201A-200 of the Washington Surface Water Quality Standards (WQS). These uses include:

- **Aquatic Life Uses:** char; salmonid and trout spawning, rearing, and migration; nonanadromous interior redband trout, and indigenous warm water species
- **Recreational Uses:** primary (swimming) and secondary (boating) contact recreation
- **Water Supply Uses:** domestic, agricultural, and industrial; and stock watering

While there may be competing beneficial uses in streams, federal law requires protection of the most sensitive of these beneficial uses.

The geology and soils of this region lead to rapid to moderate moisture infiltration. Slopes are moderate to steep, however, headwater characteristics of the watersheds lead to a high degree of infiltration as opposed to a propensity for overland flow. Thus sediment delivery efficiency of first and third order streams is fairly low. The bedrock is typically well fractured and moderately soft. This fracturing allows excessive soil moisture to infiltrate into the rock and thus surface runoff is rare. Natural mass stability hazards associated with slides are low. Natural sediment yields are low for these watersheds. However, disrupted vegetation patterns from logging (soil compaction), farming, road construction, and wildland fire (especially hot fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

Of critical importance to Okanogan County will be the maintenance of the domestic watershed supplies in the Methow River Watershed (Watershed Resources Inventory Area 48) and the Okanogan River Watershed (Watershed Resources Inventory Area 49). More discussion about these watersheds will be provided in the recommendations section.

Timberlands in the region have been extensively harvested for the past several decades, therefore altering riparian function by removing streamside shade and changing historic sediment deposition. Riparian function and channel characteristics have been altered by ranch and residential areas as well. The current conditions of wetlands and floodplains are variable. Some wetlands and floodplains have been impacted by past management activities.

Table 3.16 lists the Washington Water Resources database of municipal water supplies in Okanogan County and the Recorded Water Certificates and Permits in Okanogan County. These water sources may be placed at risk in the event of a wildland fire.

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
CHEWACK NORTH WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.59362	-120.161
BROWN S FARM WATER SYSTEM	Group B	WELL # 1	Well	OKANOGAN	16	48.54345	-120.335
FAIRWAY ACRES 3RD ADDITION	Group B	WELL #1	Well	OKANOGAN	35	48.39739	-119.578
KOKLAHANIE WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	39	48.54705	-120.346
STILLWATER RANCH PD	Group B	WELL # 1	Well	OKANOGAN	70	48.55422	-120.346
WINDHAVEN WATER SYSTEM #1	Group B	WELL # 1	Well	OKANOGAN	27	48.51052	-120.194
THOMAS WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.45507	-119.529
RANCHO HELL PD	Group B	WELL 1	Well	OKANOGAN	25	48.49961	-120.167
BURKE LEHMAN WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	5	48.37987	-120.184
GOAT CREEK NORTH #3 WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	33	48.57264	-120.385
TWIN LAKES 1	Group B	WELL #1	Well	OKANOGAN	50	48.45245	-120.2
BURKHART RANCH PD	Group B	WELL 1	Well	OKANOGAN	39	48.57989	-120.395
CROSBY PD WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.5871	-120.39
GREENLAKE PARDNERS PD	Group B	WELL 1	Well	OKANOGAN	35	48.56161	-120.363
ROUGE RANCH WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	50	48.54345	-120.335
SHUCK RANCH WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	6	48.4444	-120.14
WINDHAVEN WATER SYSTEM #2	Group B	WELL #1	Well	OKANOGAN	29	48.51052	-120.194
DI FRANCO-CRANE-MANLEY WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	40	48.5864	-120.167
FOUR SUNS PD WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	4	48.53609	-120.303
GRAY, OLIVE WATER SYSTEM	Group B	WELL A	Well	OKANOGAN	50	48.81246	-119.541
HAWLEY/BEKENDAM WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	20	48.45968	-120.194
Faith Frontier Ministries	Group B	WELL #1	Well	OKANOGAN	85	48.10484	-119.256
Faith Frontier Ministries	Group B	WELL #2	Well	OKANOGAN	250	48.10484	-119.256
GARDINIER WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	15	48.71437	-119.431
HEATH SHORT PLAT WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	25	48.52896	-120.292
KOCH WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	15	48.52869	-120.188
APPLEWAY TRAILER COURT	Group B	Well #1 - AGJ217	Well	OKANOGAN	38	48.795	-119.397
SORG SHORT PLAT WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	22	48.38697	-120.119
NEWITT WATER SYSTEM	Group B	WELL A	Well	OKANOGAN	15	48.49246	-120.183
ELLISFORDE CHURCH OF THE BRETHREN	Group B	WELL 2	Well	OKANOGAN	10	48.79451	-119.393
HURB S MARKET	Group B	Well 01	Well	OKANOGAN	0	48.56135	-119.744
DEERING WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.38292	-119.556
PASLAY-GOBLE WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	25	48.09655	-119.81
NICKELL ORCHARDS HOME WELL	Group B	WELL #1	Well	OKANOGAN	30	48.06449	-119.88
MICHAEL, SALLY WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	12	48.34347	-120.113
LIBERTY BELL HIGH SCHOOL	Non-Transient, Non-Community	Well #1	Well in Well Field	OKANOGAN	99	48.44008	-120.167
LIBERTY BELL HIGH SCHOOL	Non-Transient, Non-Community	Well #2	Well in Well Field	OKANOGAN	150	48.43981	-120.167
LIBERTY BELL HIGH SCHOOL	Non-Transient, Non-Community	WF/S01,S02	Well Field	OKANOGAN	249	48.43995	-120.167
PEACEFUL VALLEY CHURCH SCHOOL	Group B	WELL 1	Well	OKANOGAN	0	48.79451	-119.393
DAVIS LAKE WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	28	48.43729	-120.108
ARBUCKLE WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	14	48.40462	-119.578

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
SHELDON WATER SYSTEM	Group B	SPRING	Spring	OKANOGAN	2	48.40458	-119.546
KINCAID WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	11	48.37903	-119.632
PICKING WATER SYSTEM	Group B	PICKING WELL	Well	OKANOGAN	50	48.44773	-119.513
LESLIE WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	30	48.93515	-119.067
HOMESTEAD MOBILE HOME PARK	Community	Well #1	Well	OKANOGAN	250	48.428	-119.458
MADGE SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	24	48.75813	-119.425
WILSON ACRES WATER SYSTEM	Group B	WILSON WELL	Well	OKANOGAN	14	48.39746	-119.567
ROCKY BUTTE CHURCH OF THE NAZARENE	Group B	WELL # 1	Well	DOUGLAS	10	48.05779	-119.684
KARRO WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	20	48.59795	-120.417
VERBECK SHORT PLAT WATER SYSTEM	Group B	VERBECK WELL	Well	OKANOGAN	10	48.72889	-119.441
EARL PHEASANT SHORT PLAT WTR SYSTEM	Group B	WELL 1	Well	OKANOGAN	22	48.71434	-119.441
FISHER, GUY SHORT PLAT	Group B	WELL #1	Well	OKANOGAN	10	48.6534	-119.477
FIELD, RUBY WELL	Group B	WELL 1	Well	OKANOGAN	30	48.41849	-119.475
IMHOLT SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	50	48.67084	-119.222
GIBSONS NORTH FORK LODGE	Group B	Well #1	Well	OKANOGAN	15	48.55577	-119.752
RANCH HOUSE WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	70	48.59657	-119.606
REGAL - RV SYSTEM	Group B	WELL 1	Well	OKANOGAN	250	48.97241	-119.415
OROVILLE CONG.OF JEHOVAHS WITNESSES	Group B	WELL 1	Well	OKANOGAN	5	48.6706	-119.408
OKANOGAN CO.PUBLIC WORKS SHOP	Group B	OCPWD WELL	Well	OKANOGAN	180	48.37672	-119.546
FOX FAMILY WELL	Group B	FOX WELL	Well	OKANOGAN	20	48.50699	-120.259
NORTH COUNTRY CHRISTIAN SCHOOL & CG	Group B	WELL 1	Well	OKANOGAN	10	48.93516	-119.078
UNGER/WYATT WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	50	48.10736	-119.767
WALTON, BOYD WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	30	48.3406	-119.432
OLIVER/EDWARDS SHORT PLAT	Group B	WELL #1	Well	OKANOGAN	30	48.11826	-119.762
SUMMER WIND WATER SYSTEM	Group B	HANKS WELL	Well	OKANOGAN	12	48.419	-119.556
MC DANIEL, ROBERT WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	20	48.72525	-119.425
PENDRY, RALPH WATER SYSTEM	Group B	PENDRY WEELL #1	Well	FERRY	50	48.61907	-118.857
NORRIS WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	12	48.54507	-119.746
TIMMERMAN, JOHN M. WATER SYSTEM	Group B	TIMMERMAN WELL #1	Well	STEVENS	10	48.12325	-119.446
CRAMER CABIN WATER SYSTEM	Group B	CRAMER WELL #1	Well	OKANOGAN	60	48.60162	-120.444
LOTTIE STREET WELL	Group B	WELL #1	Well	OKANOGAN	3	48.56318	-119.742
FISHER, GREG WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.77632	-119.393
HAGELL, BARNETT WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	8	48.44049	-119.513
LAKEVIEW PROPERTIES #1	Group B	WELL #1	Well	OKANOGAN	15	48.68906	-119.528
GOAT WALL CABIN	Group B	WELL #1	Well	OKANOGAN	20	48.607	-120.436
WANNACUT LAKE VIEW ESTATES #1	Group B	WELL 1	Well	OKANOGAN	33	48.86651	-119.497
VISTA HILLS ESTATES 1	Group B	WELL #1	Well	OKANOGAN	400	48.70709	-119.42
WILSON RANCH PD WATER SYSTEM	Transient Non-Community	Well #1	Well	OKANOGAN	300	48.59731	-120.438
OKANOGAN COUNTY ELECTRIC CO-OP INC	Group B	WELL 1	Well	OKANOGAN	7	48.48884	-120.2
VOGLI GUEST LODGE	Group B	WELL #1	Well	OKANOGAN	22	48.4852	-120.189
BROOKS ACRES WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	22	48.8492	-119.404

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
BERGH, JEFF SHORTPLAT	Group B	WELL #1	Well	OKANOGAN	30	48.5962	-119.502
JOHNSON SHORT PLAT	Group B	WELL #1	Well	OKANOGAN	21	48.7252	-119.414
CHEWUCH RIVER GUEST HOUSE	Group B	WELL #1	Well	OKANOGAN	75	48.52506	-120.188
METHOW VALLEY UNITED METHODIST	Group B	WELL #1	Well	OKANOGAN	21	48.42337	-120.151
LONESOME DOVE	Group B	WELL 1	Well	OKANOGAN	5	48.48882	-120.183
SMITH, WINFREY WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	20	48.43703	-119.545
TICE RANCH #1	Group B	WELL 1	Well	OKANOGAN	80	48.34673	-120.043
TICE RANCH #2	Group B	WELL 1	Well	OKANOGAN	85	48.33607	-120.059
CENTRAL LANDFILL	Group B	WELL #1	Well	OKANOGAN	21	48.33934	-119.626
COUNTRY TOWN COFFEE SHOP	Group B	WELL 1	Well	OKANOGAN	50	48.25012	-120.108
VALLEY VIEW B & B	Group B	WELL 1	Well	OKANOGAN	6	48.08999	-119.989
WESTVUE RANCHETTES #3	Group B	WELL 1	Well	OKANOGAN	50	48.58894	-119.513
LAKE ROOSEVELT HIDEAWAY	Group B	WELL #1	Well	LINCOLN	18	47.93449	-118.959
LOS PALOS BED & BREAKFAST	Group B	WELL #1	Well	OKANOGAN	6	48.39759	-120.048
LAKE OSOYOOS SHORT PLAT	Group B	WELL #1	Well	OKANOGAN	23	48.99005	-119.426
CHAUNDY, SUSAN WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	50	48.447	-120.197
PRUITT, TOM SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	10	48.45504	-119.523
MAYBELL GUEST HOUSE LLC	Group B	WELL #1	Well	OKANOGAN	75	48.56533	-120.374
JOYBELL GUEST HOUSE	Group B	WELL #1	Well	OKANOGAN	70	48.56533	-120.374
GRIZZLY MOUNTAIN HOMESTEAD	Group B	WELL #1	Well	OKANOGAN	1	48.54342	-120.33
JANIS RIDGE WATER ASSN	Group B	WELL 1	Well	OKANOGAN	20	48.65341	-119.48
LAKEVIEW WATER SYSTEM	Group B	WELL #1	Well	DOUGLAS	60	48.07983	-119.71
COTTONWOOD COTTAGE	Group B	WELL 1	Well	OKANOGAN	30	48.47427	-120.21
ORO BEACH RV RESORT	Transient Non-Community	Well #1-ACJ203	Well	OKANOGAN	15	48.9707	-119.426
MOON SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	50	48.92137	-119.442
TUNK VALLEY RANCH WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	18	48.50152	-119.372
MOUNTAIN VIEW TRACTS PLAT	Group B	WELL #1 - ACB630	Well	OKANOGAN	42	48.45137	-119.518
TRANQUIL ESTATES	Group B	WELL 1 / AEB860	Well	LINCOLN	35	47.94568	-118.874
PHILLIPS SHORT PLAT WELL	Group B	WELL 1	Well	OKANOGAN	30	48.4186	-119.491
CRYSTAL BROOK ESTATES	Group B	WELL 1	Well	OKANOGAN	40	48.15594	-119.667
SAWTAIL RANCH	Group B	WELL 1	Well	OKANOGAN	20	48.92354	-119.418
PINE CREEK HOUSING	Transient Non-Community	Well #2	Well in Well Field	OKANOGAN	30	48.69105	-119.465
PINE CREEK HOUSING	Transient Non-Community	Well #3	Well in Well Field	OKANOGAN	30	48.69107	-119.465
PINE CREEK HOUSING	Transient Non-Community	WF/S02, S03	Well Field	OKANOGAN	60	48.69106	-119.465
KEYSTONE RANCH	Transient Non-Community	Well #1 - AGJ225	Well	OKANOGAN	40	48.56138	-119.483
NEFF S ALTA VISTA ORCHARDS INC	Group B	Well #1	Well	OKANOGAN	10	48.06073	-119.937
WADDELL RANCH	Group B	WELL 1	Well	OKANOGAN	20	48.24418	-119.741
INDIAN CAMP - BUCKHORN MT ORCHARD	Transient Non-Community	Dug Well #1	Well	OKANOGAN	40	48.06	-119.948
JN CAMP - BUCKHORN MT ORCHARDS	Transient Non-Community	Well #2	Well	OKANOGAN	38	48.10617	-119.677
SMITH & NELSON	Transient Non-Community	Well #1 - AGJ201	Well	OKANOGAN	50	48.81461	-119.607
OK RANCH INC	Transient Non-Community	Well #1 - AGJ243	Well	OKANOGAN	30	48.78347	-119.427

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
Gold Digger Apples (Kernan)	Group B	WELL 1(DUG WELL)	Well	OKANOGAN	6	48.94635	-119.469
Gold Digger Apples (Kernan)	Group B	WELL 2 (NEW WELL)	Well	OKANOGAN	10	48.94635	-119.469
POIRIER ORCHARD	Transient Non-Community	Well #1 AGJ118	Well	OKANOGAN	25	48.06939	-119.951
ARNOLD TRACTS WATER SYSTEM	Group B	AEM861 WELL 1	Well	OKANOGAN	40	48.45873	-119.529
BONAPARTE LAKE RESORT	Transient Non-Community	Well #2 - AGJ199	Well	OKANOGAN	300	48.79778	-119.054
LAST CHANCE LODGE PD 1	Group B	WELL 1	Well	OKANOGAN	30	48.40536	-120.233
LAST CHANCE LODGE PD 2	Group B	WELL 1	Well	OKANOGAN	30	48.40177	-120.244
OLD ORCHARD ESTATES WATER SYSTEM	Community	Old Orchard Well #1	Well in Well Field	OKANOGAN	26	48.71896	-119.43
OLD ORCHARD ESTATES WATER SYSTEM	Community	Old Orchard Well #2	Well in Well Field	OKANOGAN	26	48.71895	-119.43
OLD ORCHARD ESTATES WATER SYSTEM	Community	WF/S01,S02	Well Field	OKANOGAN	45	48.71896	-119.43
WESTERDAHL ORCHARDS - TENT CAMP	Group B	WELL 1	Well	DOUGLAS	8	48.03523	-119.692
AREVALO S WELL	Group B	ACE899 WELL 1	Well	OKANOGAN	75	48.13994	-119.756
P AND G ORCHARDS CAMP 2	Community	Camp 2 Well	Well	OKANOGAN	0	48.11526	-119.7
P AND G ORCHARDS CAMP 3	Community	Well #1 - Camp 3	Well	OKANOGAN	0	48.13983	-119.689
CAMPBELL SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	45	48.41196	-120.14
FDR ESTATES #5	Group B	AFB116 FDR 5	Well	LINCOLN	30	47.93448	-118.955
FDR ESTATES #6	Group B	FDR 6 WELL 1	Well	LINCOLN	0	47.93448	-118.955
CUSTOM ORCHARD 1	Transient Non-Community	Well #1	Well	OKANOGAN	30	48.08928	-119.816
SPRING COULEE HEIGHTS WATER SYSTEM	Group B	WELL #1 - AEQ596	Well	OKANOGAN	37	48.35027	-119.626
FOSTER GUEST RANCH #2	Group B	WELL 1	Well	OKANOGAN	45	48.5871	-120.39
BEACH FLAT WATER SYSTEM	Group B	ACN043 WELL 1	Well	OKANOGAN	40	48.44407	-119.507
HEAVEN HILLS ESTATES	Group B	ACS194 WELL 1	Well	OKANOGAN	20	48.85282	-119.404
JAW FARMS INC	Community	Gordon Spring	Spring	OKANOGAN	35	48.33195	-119.681
JAW FARMS INC	Community	Canyon Well	Well	OKANOGAN	100	48.31211	-119.716
JAW FARMS INC	Community	Turner Spring	Spring	OKANOGAN	10	48.33553	-119.675
JAW FARMS INC	Community	Tract 2 Well	Well	OKANOGAN	25	48.32764	-119.676
PALMER LAKE LAND COMPANY	Transient Non-Community	Well #1	Well	OKANOGAN	30	48.91409	-119.62
BREWSTER FLAT DOMESTIC WATER ASSN	Community	Well #1	Well in Well Field	OKANOGAN	50	48.15461	-119.755
BREWSTER FLAT DOMESTIC WATER ASSN	Community	Well #2	Well in Well Field	OKANOGAN	25	48.15465	-119.755
BREWSTER FLAT DOMESTIC WATER ASSN	Community	WF/S01, S02, S05	Well Field	OKANOGAN	95	48.15459	-119.755
BREWSTER FLAT DOMESTIC WATER ASSN	Community	Well #4	Well in Well Field	OKANOGAN	60	48.1545	-119.755
BREWSTER FLAT DOMESTIC WATER ASSN	Community	Well #5	Well	OKANOGAN	160	48.15351	-119.761
BREWSTER, CITY OF	Community	Well #1	Well in Well Field	OKANOGAN	250	48.09208	-119.798
BREWSTER, CITY OF	Community	Well #2	Well in Well Field	OKANOGAN	750	48.09208	-119.798
BREWSTER, CITY OF	Community	Canyon Well	Well	OKANOGAN	800	48.10764	-119.79
BREWSTER, CITY OF	Community	WF/S01,S02	Well Field	OKANOGAN	1000	48.09208	-119.798
BAR DEVELOPMENT WATER USERS	Community	Well #1 - AGJ129	Well	DOUGLAS	150	48.06392	-119.694
BRIDGEPORT, CITY OF	Community	Well #1 - AGJ126	Well	DOUGLAS	650	48.01228	-119.675
BRIDGEPORT, CITY OF	Community	Well #2 - AGJ127	Well	DOUGLAS	500	48.00832	-119.668
BRIDGEPORT, CITY OF	Community	Well #3 - AGJ128	Well	DOUGLAS	500	48.00236	-119.664
CHESAW WATER ASSN #1	Group B	AFQ895 WELL 1	Well	OKANOGAN	75	48.94213	-119.05

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
CHESAW WATER ASSN #2	Group B	AFQ894 WELL 1	Well	OKANOGAN	75	48.94213	-119.05
CONCONULLY LAKE RESORT	Transient Non-Community	Well #1 AGJ169	Well	OKANOGAN	30	48.56481	-119.73
CONCONULLY LAKE RESORT	Transient Non-Community	Well #2 - AGM290 - Unapproved	Well	OKANOGAN	14	48.56683	-119.731
SANDFLAT WATER ASSOCIATION	Community	Orchard Trail Well - AGJ180	Well	OKANOGAN	250	48.41651	-119.494
SANDFLAT WATER ASSOCIATION	Community	South Well	Well	OKANOGAN	190	48.41614	-119.493
ASTON ESTATES	Community	Well #1 - AGJ184	Well in Well Field	OKANOGAN	40	48.40744	-119.487
ASTON ESTATES	Community	Well #2 - AGJ185	Well in Well Field	OKANOGAN	85	48.4064	-119.487
ASTON ESTATES	Community	Well #3 - AGJ183	Well in Well Field	OKANOGAN	0	48.40745	-119.486
ASTON ESTATES	Community	WF/S01, S02, S03, S04	Well Field	OKANOGAN	125	48.4073	-119.485
ASTON ESTATES	Community	Well #4	Well in Well Field	OKANOGAN	15	48.40791	-119.481
WOLF CREEK PROPERTY OWNERS ASSN	Transient Non-Community	Well #1 (main well)	Well in Well Field	OKANOGAN	50	48.49508	-120.258
WOLF CREEK PROPERTY OWNERS ASSN	Transient Non-Community	Well #2 (emergency well)	Well in Well Field	OKANOGAN	50	48.49627	-120.263
WOLF CREEK PROPERTY OWNERS ASSN	Transient Non-Community	WF/S01,S03	Well Field	OKANOGAN	100	48.49568	-120.261
RIVERVIEW WATER ASSOCIATION	Group B	WELL 1	Well	OKANOGAN	230	48.09294	-119.809
CHELAN CO PUD 1	Community	Hawley St Wells 1,2,&3	Well	CHELAN	1850	48.34274	-119.973
BONAPARTE BOY SCOUT CAMP	Group B	WELL#1 AGJ200	Well	OKANOGAN	20	48.8071	-119.049
CHESAW WATER SYSTEM	Group B	WELL 1	Spring	OKANOGAN	60	48.94574	-119.05
PINECREST SUBDIVISION OWNERS	Community	Well #1	Well	OKANOGAN	200	48.60755	-119.511
CRUMBACHER ESTATES WATER SYSTEM	Community	Well #1 AGJ191	Well in Well Field	OKANOGAN	55	48.59485	-119.514
CRUMBACHER ESTATES WATER SYSTEM	Community	Well #2 AGJ189	Well in Well Field	OKANOGAN	450	48.59476	-119.514
CRUMBACHER ESTATES WATER SYSTEM	Community	WF/S01,S02	Well Field	OKANOGAN	505	48.59481	-119.514
COLEMAN BUTTE WATER ASSN	Community	Well #1A	Well in Well Field	OKANOGAN	75	48.45312	-119.511
COLEMAN BUTTE WATER ASSN	Community	Well #1B	Well in Well Field	OKANOGAN	75	48.45312	-119.511
COLEMAN BUTTE WATER ASSN	Community	WF/S01, S02	Well Field	OKANOGAN	150	48.45312	-119.511
COULEE DAM WATER DEPT	Community	East Side Water	Surface	OKANOGAN	1900	47.96418	-118.993
CRANE & CRANE INC	Community	WELL 1	Well	DOUGLAS	90	48.07678	-119.828
JOHNS LANDING MOBILE HOME PARK	Community	Well #1 - AGJ218	Well	OKANOGAN	28	48.69661	-119.456
ALTA LAKE GOLF COURSE PLAT	Community	WELL 2	Well in Well Field	OKANOGAN	32	48.03587	-119.94
ALTA LAKE GOLF COURSE PLAT	Community	WF/S02,205	Well Field	OKANOGAN	132	48.03586	-119.94
ALTA LAKE GOLF COURSE PLAT	Community	WELL 5	Well in Well Field	OKANOGAN	100	48.03584	-119.94
DOWNING TOWNSITE WATER DISTRICT	Community	Well #2 - ABR293	Well in Well Field	DOUGLAS	200	48.04104	-119.69
DOWNING TOWNSITE WATER DISTRICT	Community	WF/S01,2,3	Well Field	DOUGLAS	500	48.04104	-119.69
DOWNING TOWNSITE WATER DISTRICT	Community	Well #4 - ABI700	Well	DOUGLAS	150	48.04085	-119.69
DUCK LAKE WATER ASSOCIATION	Community	Well #1 - AGJ186	Well	OKANOGAN	80	48.43666	-119.552
DUCK LAKE WATER ASSOCIATION	Community	Well #2 - AAI243	Well	OKANOGAN	400	48.44563	-119.548
VISTA VU WATER USERS ASSN	Community	Well #1	Well	OKANOGAN	200	48.41014	-119.501
CHEROKEE FARMS	Group B	WELL #1	Well	OKANOGAN	25	48.43805	-119.47
EDELWEISS MAINTENANCE COMMISSION	Community	Well #1	Well	OKANOGAN	70	48.56501	-120.354
EDELWEISS MAINTENANCE COMMISSION	Community	Well #2	Well	OKANOGAN	200	48.55035	-120.33
EDELWEISS MAINTENANCE COMMISSION	Community	Well #3	Well	OKANOGAN	160	48.54702	-120.33



**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
ELLISFORDE GROCERY	Group B	Well 01	Well	OKANOGAN	0	48.7927	-119.395
ELMER CITY WATER SYSTEM	Community	Well #1 - AGJ132	Well	OKANOGAN	450	47.99765	-118.958
ELMER CITY WATER SYSTEM	Community	Well #2	Well	OKANOGAN	240	47.99412	-118.95
SUNNY HILLS WATER SYSTEM	Transient Non-Community	WELL 1	Well	LINCOLN	100	47.94612	-118.88
EASTLAKE WATER ASSOCIATION	Community	Well #1 - AGJ205	Well in Well Field	OKANOGAN	12	48.95392	-119.419
EASTLAKE WATER ASSOCIATION	Community	Well #2 - AGJ204	Well in Well Field	OKANOGAN	4	48.95378	-119.419
EASTLAKE WATER ASSOCIATION	Community	WF/S01,S02	Well Field	OKANOGAN	16	48.95385	-119.419
EASTLAKE WATER ASSOCIATION	Community	Well #3 - UNAPPROVED	Well	OKANOGAN	120	48.95062	-119.41
EMANUEL HEIGHTS WATER SYSTEM	Community	Well #1 AGJ130	Well	OKANOGAN	100	48.15233	-119.761
NORTH CASCADES BASECAMP	Group B	WELL 1	Well	OKANOGAN	30	48.61245	-120.444
WAY S WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	0	48.38819	-119.548
BEAR CREEK GOLF COURSE	Transient Non-Community	Well #1	Well	OKANOGAN	10	48.45841	-120.135
OROVILLE GOLF CLUB	Transient Non-Community	Well #1 AGJ260	Well	OKANOGAN	1	48.95391	-119.478
DAMMANN BED AND BREAKFAST	Group B	DRILLED WELL	Well	OKANOGAN	0	48.54864	-120.175
SITZMARK SKI AREA	Group B	AGJ194 DRILLED WELL 6 CASE	Well	OKANOGAN	2	48.8636	-119.165
TAMARACK SALOON	Transient Non-Community	TAMARACK INN AGJ237	Well	OKANOGAN	0	48.56032	-119.75
WAUCONDA CAFE	Transient Non-Community	WELL #1 - AGJ190	Well	OKANOGAN	20	48.7262	-119.013
AENEAS GENERAL STORE	Group B	AENEAS GENERAL STORE	Well	OKANOGAN	30	48.56666	-119.035
CONCONULLY CITY WELL	Transient Non-Community	Well #1 AGJ234	Well	OKANOGAN	20	48.55921	-119.751
ROADWAY STORES INC	Transient Non-Community	Well #2 - AGJ134	Well	OKANOGAN	30	48.28277	-119.706
FAIR WAY ACRES 2ND ADDITION	Group B	GREEN	Well	OKANOGAN	3	48.40284	-119.57
GRAND COULEE DAM	Non-Transient, Non-Community	FDR Lake	Surface	GRANT	480	47.9583	-118.974
GRAND COULEE WATER DEPT, CITY OF	Community	Lake Roosevelt	Surface	GRANT	950	47.93889	-118.976
GRAND COULEE WATER DEPT, CITY OF	Community	Crescent Lk Well #1 - AFA121	Well	GRANT	150	47.93673	-118.982
GRAND COULEE WATER DEPT, CITY OF	Community	Crescent Lk Well #2 - AFA120	Well	GRANT	350	47.93648	-118.983
COLD SPRINGS CAMPGROUND	Group B	COLD SPRINGS	Spring	OKANOGAN	0	48.93443	-119.784
GARNER-SMITH-OGILVIE	Group B	WELL 1	Well	OKANOGAN	80	48.70525	-119.439
MAPLE FLATS RV PARK	Group B	WELL 1	Well	OKANOGAN	0	48.56135	-119.744
MAZAMA COUNTRY INN	Group B	WELL 1	Well	OKANOGAN	45	48.59072	-120.406
SPRUCE CORNER SHORT PLAT	Group B	WELL	Well	OKANOGAN	30	48.93795	-119.418
WESTERDAHL WATER SYSTEM	Group B	WELL 1	Well	DOUGLAS	40	48.06955	-119.721
TWIN PINES MOBILE HOME PARK	Group B	WELL 1	Well	OKANOGAN	100	48.68157	-119.458
PETITT ACRES WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	30	48.30307	-119.698
FAIRWAY ACRES WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	27	48.39746	-119.567
COUNTRY TOWN MOTEL & RV	Group B	WELL #1	Well	OKANOGAN	60	48.2501	-120.115
HIGHLAND FIRE CAMP	Group B	WELL # 1	Well	OKANOGAN	60	48.77574	-119.66
HIGHLAND ORCHARDS	Group B	WELL 1	Well	DOUGLAS	75	48.03587	-119.557
EAGLE PINE CHALETs	Group B	WELL 1	Well	OKANOGAN	35	48.45238	-120.183
BREWSTER SDA SCHOOL	Non-Transient, Non-Community	Well #1 AGJ121	Well	OKANOGAN	37	48.15209	-119.757
WILLIAMSON SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	10	48.41827	-119.462



**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
APPLE FACTORY SMOKEHOUSE	Group B	WELL	Well	OKANOGAN	12	48.43146	-119.657
ROCKING R BED AND BREAKFAST	Group B	WELL #1	Well	OKANOGAN	10	48.41795	-120.154
OLIVER WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	50	48.24418	-119.741
TWISP TRANSFER STATION	Group B	WELL #1	Well	OKANOGAN	96	48.35976	-120.111
SILVERLINE RESORT	Transient Non-Community	WELL #1 AGJ146	Well	OKANOGAN	70	48.49273	-120.164
CARLTON GENERAL STORE	Group B	WELL 1	Well	OKANOGAN	20	48.24469	-120.111
METHOW VALLEY MEATS	Group B	WELL	Well	OKANOGAN	30	48.35976	-120.111
MAZAMA STORE	Transient Non-Community	Well #2	Well	OKANOGAN	30	48.59338	-120.406
NYSTROM WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	37	48.27217	-119.72
OKANOGAN COUNTY FAIR WATER SYSTEM	Transient Non-Community	Well #1 - AGJ177	Well	OKANOGAN	150	48.37785	-119.552
OKANOGAN COUNTY FAIR WATER SYSTEM	Transient Non-Community	Well #2 - AEM643	Well	OKANOGAN	150	48.37817	-119.552
DEVOIR WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	60	48.59364	-120.172
ROBINSON SHORT PLAT	Group B	WELL #1	Well	OKANOGAN	10	48.76363	-119.417
HIDDEN HILLS GUEST RANCH	Group B	WELL #1	Well	OKANOGAN	43	48.61441	-119.649
AMY S BED & BREAKFAST	Group B	WELL	Well	OKANOGAN	10	48.08452	-119.981
BLACK ROAD	Group B	ARTESIAN #1	Well	OKANOGAN	15	48.40278	-119.548
BLACK ROAD	Group B	ARTESIAN #2	Well	OKANOGAN	15	48.40278	-119.548
RIVER RUN INN	Group B	WELL #1	Well	OKANOGAN	80	48.47607	-120.197
JACKS RV PARK 1	Transient Non-Community	Well #1	Well	OKANOGAN	50	48.55781	-119.749
JACKS RV PARK 1	Transient Non-Community	Well #2	Well	OKANOGAN	30	48.55779	-119.749
HENDRICK WATER SYSTEM	Group B	WELL	Well	OKANOGAN	25	48.40278	-119.548
STRATTON WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	26	48.2866	-119.7
ALTAS WEST BEACH WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	35	48.01266	-119.944
SIT N BULL SALOON	Transient Non-Community	WELL #1 - AGJ238	Well	OKANOGAN	30	48.55972	-119.75
MOLSON GRANGE AND MUSEUM	Group B	WELL 1	Well	OKANOGAN	5	48.98243	-119.194
CHESAW MEATS (CUSTOM)	Group B	WELL	Well	OKANOGAN	4	48.94574	-119.05
CASCADE SERVICES SUBDIVISION	Group B	WELL #1	Well	OKANOGAN	55	48.3597	-120.089
JOHNSON CREEK WATER USERS ASSN	Community	Well #1	Well in Well Field	OKANOGAN	15	48.48059	-119.556
JOHNSON CREEK WATER USERS ASSN	Community	Well #2 - AGJ187	Well in Well Field	OKANOGAN	70	48.48141	-119.556
JOHNSON CREEK WATER USERS ASSN	Community	WF/S01,S02	Well Field	OKANOGAN	85	48.481	-119.556
ZEKE & JUDY S MOBILE HOMES	Group B	WELL 1	Well	OKANOGAN	10	48.9578	-119.421
BARRINGER WATER SYSTEM	Group B	WELL	Well	OKANOGAN	40	48.36152	-120.086
LEDER SHORT PLAT WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	15	48.23206	-120.108
WOODCREST FALLS	Group B	WELL	Well	OKANOGAN	25	48.56659	-119.485
HILLSIDE ACRES WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	15	48.30815	-119.641
SHELLROCK VISTA WATER USERS ASSN	Group B	WELL 1	Well	OKANOGAN	20	48.39735	-119.546
GREENE & ROSSER WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	30	48.4452	-120.2
BRETZ WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	100	48.68151	-119.398
CHOKECHERRY INN	Group B	WELL 1	Well	OKANOGAN	20	48.59797	-120.401
OUR LADY OF VALLEY CATHOLIC CHURCH	Transient Non-Community	Well #1 - AGJ155	Well	OKANOGAN	23	48.38838	-119.554
FLYING B GASOLINE INC. WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	20	48.37569	-119.573

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
WESTAR RETREAT	Group B	WELL 1	Well	OKANOGAN	25	48.52869	-120.188
WESTAR RETREAT	Group B	WELL 2	Well	OKANOGAN	25	48.52869	-120.188
WHITE WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	60	48.38292	-119.562
ECKLEY, ROBERT WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	22	48.87739	-119.513
KING, MARION WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	30	48.37265	-120.184
PETERSON, ELIZABETH WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	15	48.40105	-119.557
LAKE SHORE APARTMENTS	Group B	Well 01	Well	OKANOGAN	10	48.98145	-119.418
LAKEVIEW ORCHARDS	Group B	WELL	Well	DOUGLAS	60	48.07848	-119.825
LIARS COVE	Transient Non-Community	Well #1 AGJ168	Well	OKANOGAN	41	48.54959	-119.747
LIBERTY WOODLANDS	Group B	WELL 1 (1972)	Well	OKANOGAN	100	48.5579	-120.363
LIBERTY WOODLANDS	Group B	WELL 2 (1981)	Well	OKANOGAN	100	48.5579	-120.363
LIBERTY WOODLANDS	Group B	WELL 3 (1998)	Well	OKANOGAN	105	48.5579	-120.363
LONE PINE WATER ASSN	Community	Well #1 - AGJ131	Well	OKANOGAN	123	47.98091	-118.965
LOOMIS WATER USERS ASSN INC	Community	Well #2	Well in Well Field	OKANOGAN	130	48.82027	-119.637
LOOMIS WATER USERS ASSN INC	Community	Well #3	Well in Well Field	OKANOGAN	130	48.82026	-119.637
LOOMIS WATER USERS ASSN INC	Community	WF/S02,S03	Well Field	OKANOGAN	275	48.82027	-119.637
LOST RIVER AIRPORT ASSOCIATION	Transient Non-Community	Well #1 AGJ150	Well	OKANOGAN	90	48.64928	-120.499
LOST RIVER AIRPORT ASSOCIATION	Transient Non-Community	Well #3 AGJ151	Well	OKANOGAN	100	48.64529	-120.503
M J TRAILER RANCH	Community	WELL 1	Well in Well Field	OKANOGAN	110	48.30194	-119.66
M J TRAILER RANCH	Community	WELL 2	Well in Well Field	OKANOGAN	100	48.30354	-119.659
M J TRAILER RANCH	Community	WF/S01,S02,S04	Well Field	OKANOGAN	275	48.30307	-119.658
M J TRAILER RANCH	Community	Well #3	Well in Well Field	OKANOGAN	65	48.30372	-119.654
DEER RUN PUD WATER SYSTEM	Group B	WELL 1(8 DIAMETER)	Well	OKANOGAN	300	48.58723	-120.531
DEER RUN PUD WATER SYSTEM	Group B	WELL 2(6 DIAMETER)	Well	OKANOGAN	52	48.58723	-120.531
RSG WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	39	48.75447	-119.425
RAINBOW PINES HELIPORT	Group B	WELL #1	Well	OKANOGAN	20	48.60164	-120.46
WILSON WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	12	48.02716	-119.934
ECKLEY, BOB SHORT PLAT	Group B	WELL 1	Well	OKANOGAN	4	48.88462	-119.508
MCDANIEL WATER SYSTEM	Group B	WELL #1	Well	OKANOGAN	12	48.79443	-119.431
MUNCE WATER SYSTEM	Group B	WELL 1	Well	OKANOGAN	250	48.63195	-119.159
SHEETS WATER SYSTEM	Group B	WELL	Well	OKANOGAN	20	48.43689	-119.518
METHOW WATER SYSTEM INC	Community	Well #2	Well	OKANOGAN	616	48.1323	-120.005
METHOW WATER SYSTEM INC	Community	Well #3	Well	OKANOGAN	150	48.13066	-120.003
MOLSON WATER USERS	Transient Non-Community	Well #1 AGJ193	Well	OKANOGAN	200	48.98363	-119.201
ROCK CREEK WELL	Group B	WELL #1	Well	OKANOGAN	35	47.97676	-120.003
ROMINE WELL	Group B	WELL #1	Well	OKANOGAN	15	48.44766	-119.502
NESPELEM WATER DEPT	Community	Well #3	Well	OKANOGAN	600	48.18051	-118.985
DOLGNER WATER SYSTEM	Group B	SPRING 1	Spring	OKANOGAN	30	48.41181	-119.556
PINEY WOODS PHD	Group B	WELL #1	Well	OKANOGAN	15	48.43061	-120.162
OUTWARD BOUND WEST	Group B	WELL #1	Well	OKANOGAN	12	48.6052	-120.433
RANDY S RECYCLING	Group B	WELL #1	Well	OKANOGAN	8	48.38292	-119.562

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
OKANOGAN LIVESTOCK MARKET INC	Group B	WELL 1	Well	OKANOGAN	50	48.70525	-119.439
OKANOGAN WATER DEPARTMENT, CITY OF	Community	Eastside	Well	OKANOGAN	185	48.36222	-119.576
OKANOGAN WATER DEPARTMENT, CITY OF	Community	Well #3 AGJ158	Well	OKANOGAN	380	48.37727	-119.569
OKANOGAN WATER DEPARTMENT, CITY OF	Community	Well #4 AGJ157	Well	OKANOGAN	400	48.35653	-119.586
OKANOGAN WATER DEPARTMENT, CITY OF	Community	Well #5 AGJ156	Well	OKANOGAN	300	48.35531	-119.596
OMAK, CITY OF	Community	Eastside Well - AGJ179	Well	OKANOGAN	2800	48.39904	-119.522
OMAK, CITY OF	Community	Apple Well	Well	OKANOGAN	480	48.40916	-119.535
OMAK, CITY OF	Community	Kenwood	Well	OKANOGAN	500	48.4117	-119.529
OMAK, CITY OF	Community	Okoma Well	Well	OKANOGAN	500	48.40083	-119.541
OMAK, CITY OF	Community	Park Well - AGJ178	Well	OKANOGAN	250	48.41071	-119.515
OMAK, CITY OF	Community	OWP Well	Well	OKANOGAN	1300	48.4001	-119.519
OMAK, CITY OF	Community	Well #9	Well	OKANOGAN	120	48.42773	-119.495
OROVILLE, CITY OF	Community	Well #1 - AGJ207	Well in Well Field	OKANOGAN	500	48.93689	-119.44
OROVILLE, CITY OF	Community	Well #2 - AGJ208	Well in Well Field	OKANOGAN	600	48.93634	-119.44
OROVILLE, CITY OF	Community	Well #3 - AGJ206	Well in Well Field	OKANOGAN	540	48.93694	-119.441
OROVILLE, CITY OF	Community	Well #4 - AGJ209	Well	OKANOGAN	950	48.94588	-119.436
OROVILLE, CITY OF	Community	WF/S01.2.3	Well Field	OKANOGAN	1640	48.93672	-119.441
PATEROS WATER DEPARTMENT	Community	Well #1 - AGJ116	Well in Well Field	OKANOGAN	560	48.05478	-119.9
PATEROS WATER DEPARTMENT	Community	Well #2 - AGJ117	Well in Well Field	OKANOGAN	300	48.05475	-119.9
PATEROS WATER DEPARTMENT	Community	WF/S01.S02	Well Field	OKANOGAN	800	48.05477	-119.9
PINE FOREST WATER SYSTEM	Community	North Well #1 - AGJ239	Well in Well Field	OKANOGAN	8	48.44085	-120.237
PINE FOREST WATER SYSTEM	Community	South Well #2 - AGJ241	Well	OKANOGAN	12	48.4278	-120.249
PINE FOREST WATER SYSTEM	Community	North Well #3 - AFH625	Well in Well Field	OKANOGAN	25	48.44081	-120.237
PINE FOREST WATER SYSTEM	Community	North WF/S01.S03.S05	Well Field	OKANOGAN	51	48.44084	-120.237
PINE FOREST WATER SYSTEM	Community	Well #4 - AFH627	Well in Well Field	OKANOGAN	18	48.44086	-120.237
PROGRESSIVE FLAT WATER ASSN	Community	Well #1 ABR207	Well in Well Field	OKANOGAN	50	48.39465	-119.58
PROGRESSIVE FLAT WATER ASSN	Community	Well #2 AGJ160	Well in Well Field	OKANOGAN	20	48.39456	-119.58
PROGRESSIVE FLAT WATER ASSN	Community	WF/S01.S02	Well Field	OKANOGAN	70	48.39461	-119.58
RAINBOW RESORT	Transient Non-Community	Well #1 - AGJ213	Well	OKANOGAN	10	48.80905	-119.555
REYNOLDS RESORT	Group B	SPRING	Spring	OKANOGAN	10	48.0738	-118.907
REYNOLDS RESORT	Group B	WELL #1	Well	OKANOGAN	11	48.0738	-118.907
RICH ACRES WATER CORP	Community	Well #1	Well	DOUGLAS	54	48.06697	-119.691
RIGGS WATER SYSTEM	Group B	WELL 1	Well	DOUGLAS	0	48.06955	-119.721
RIVERBEND RV PARK	Transient Non-Community	Well #3 - AGJ138	Well	OKANOGAN	20	48.39015	-120.134
RIVERSIDE, TOWN OF	Community	Well #1 - AGJ188	Well	OKANOGAN	325	48.50378	-119.511
RIVERSIDE, TOWN OF	Community	Well #2 - ABR845	Well	OKANOGAN	250	48.50319	-119.511
ROCKY BUTTE WATER	Community	Well #1 AGJ246	Well in Well Field	DOUGLAS	125	48.05574	-119.692
ROCKY BUTTE WATER	Community	Well #2 AGJ245	Well in Well Field	DOUGLAS	125	48.05572	-119.691
ROCKY BUTTE WATER	Community	WF/S01.S02	Well Field	DOUGLAS	250	48.05573	-119.691
SEATONS GROVE COMMUNITY ULID 2	Community	Peter Dan Canyon Well - AGJ242	Well	OKANOGAN	70	48.01577	-118.942

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
SEEVVIEW HEIGHTS WATER USERS CORP	Group B	WELL #1	Well	OKANOGAN	80	48.99428	-119.439
SHADY PINES RESORT	Transient Non-Community	Well #1 AGJ167	Well	OKANOGAN	15	48.54301	-119.759
SPECTACLE FALLS RESORT	Transient Non-Community	Well #1 - AGJ212	Well	OKANOGAN	15	48.81584	-119.576
SPECTACLE LAKE RESORT	Transient Non-Community	Well #1 AGJ214	Well	OKANOGAN	80	48.80964	-119.532
SPECTACLE LAKE RESORT	Transient Non-Community	Well #2 AGL568	Well	OKANOGAN	22	48.80949	-119.532
SUN COVE RESORT	Transient Non-Community	Well #1 - 1 AGJ216	Well	OKANOGAN	85	48.87816	-119.511
SUN COVE RESORT	Transient Non-Community	Well #2 - AGJ215	Well	OKANOGAN	10	48.87675	-119.511
SUN COVE RESORT	Transient Non-Community	Spring #1	Spring	OKANOGAN	10	48.88102	-119.502
SUN MOUNTAIN RESORT	Transient Non-Community	Patterson Lake	Surface	OKANOGAN	80	48.46523	-120.251
SUNCREST PLAT WATER SYSTEM	Community	Well #1-AGJ181	Well in Well Field	OKANOGAN	300	48.41358	-119.497
SUNCREST PLAT WATER SYSTEM	Community	Well #2-AGJ182	Well in Well Field	OKANOGAN	200	48.41206	-119.497
SUNCREST PLAT WATER SYSTEM	Community	WF/S01,S02	Well Field	OKANOGAN	300	48.41282	-119.497
LAZY DAZE RV PARK	Transient Non-Community	Well #1 - AGJ173	Well	OKANOGAN	20	48.55864	-119.749
LAKESIDE BBQ & STORE	Group B	WELL #1	Well	OKANOGAN	100	48.49223	-120.156
TIMM BROS WATER SYSTEM	Group B	WELL # 1	Well	DOUGLAS	40	48.06778	-119.718
TONASKET WATER SYSTEM	Community	Well #1 - AGJ222	Well	OKANOGAN	250	48.70359	-119.443
TONASKET WATER SYSTEM	Community	Well #2 - ABJ223	Well	OKANOGAN	250	48.70296	-119.443
TONASKET WATER SYSTEM	Community	Well #4	Well	OKANOGAN	200	48.71071	-119.441
TONASKET WATER SYSTEM	Community	Well #5 - AGJ221	Well	OKANOGAN	390	48.70969	-119.44
TONASKET WATER SYSTEM	Community	Well #6 - AGJ220	Well	OKANOGAN	300	48.70465	-119.446
TWISP, TOWN OF	Community	Well #1	Well	OKANOGAN	450	48.36895	-120.119
TWISP, TOWN OF	Community	Well #3 - AGJ154	Well	OKANOGAN	650	48.35757	-120.112
TWISP, TOWN OF	Community	Well #2 - AGJ153	Well	OKANOGAN	750	48.36475	-120.12
TWISP, TOWN OF	Community	Well #4 - ACL692 - UNAPPROVED	Well	OKANOGAN	60	48.35797	-120.113
WAGON WHEEL BAR & GRILL	Transient Non-Community	Well #1 - AGJ133	Well	OKANOGAN	25	48.28277	-119.707
WASHBURN WATER SYSTEM	Group B	Well 01	Well	DOUGLAS	0	48.06955	-119.721
WELLS HYDROELECTRIC PROJECT	Non-Transient, Non-Community	Well #1	Well	CHELAN	3000	47.94945	-119.877
WELLS HYDROELECTRIC PROJECT	Non-Transient, Non-Community	Well #4	Well	CHELAN	500	47.9491	-119.87
METHOW VALLEY KOA CAMPGROUND	Transient Non-Community	WELL #1 - AGJ142	Well	OKANOGAN	60	48.4632	-120.171
WINTHROP, TOWN OF	Community	Primary Well	Well in Well Field	OKANOGAN	640	48.47179	-120.182
WINTHROP, TOWN OF	Community	Reserve Well	Well in Well Field	OKANOGAN	270	48.47194	-120.182
WINTHROP, TOWN OF	Community	WF/S01,S02	Well Field	OKANOGAN	800	48.47187	-120.182
CHAR-DONNIE	Group B	Well #1 - ACS225	Well	LINCOLN	16	47.93075	-118.944
SKALITUDE	Group B	WELL #1 - AFQ789	Well	OKANOGAN	0	48.29354	-119.386
PALMER GRANDVIEW	Group B	Well #1 - AGM235	Well	OKANOGAN	29	48.91008	-119.606
VICKIES PIE SHOP	Group B	WELL #1	Well	OKANOGAN	8	48.56135	-119.744
LOUP LOUP SKI EDUCATION FOUNDATION	Group B	Well #1	Well	OKANOGAN	20	48.39378	-119.907
Goat Peak	Group B	Goat Peak Well	Well	OKANOGAN	40	48.57264	-120.385
BEAVER LAKE CG - TONASKET RD	Group B	Well #1	Well	OKANOGAN	3	48.84977	-118.969
BONAPARTE WELL 4 - TONASKET RD	Group B	Well #4	Well	OKANOGAN	18	48.79654	-119.056

**Table 3.16. Municipal Water Sources in Okanogan County.**

System Name	System Type	Source Name	Source Type	County	Capacity	Latitude	Longitude
EIGHTMILE RANCH - METHOW RD	Group B	Well #1 - AEQ532	Well	OKANOGAN	40	48.60086	-120.167
EARLY WINTERS WC - METHOW RD	Transient Non-Community	Well #1	Well	OKANOGAN	20	48.59957	-120.437
FLAT CG - METHOW RD	Group B	Well #1	Well	OKANOGAN	3	48.61421	-120.195
KLIPCHUCK CG - METHOW RD	Transient Non-Community	Klipchuck Well	Well	OKANOGAN	6	48.60158	-120.518
BETH LAKE CG - TONASKET RD	Group B	Well #1	Well	OKANOGAN	20	48.85896	-118.985
LONE FIR CG - METHOW RD	Group B	Well #1	Well	OKANOGAN	5	48.58076	-120.625
LOST LAKE CG - TONASKET RD	Transient Non-Community	Spring	Spring	OKANOGAN	50	48.84138	-119.051
ORIOLE CG - TONASKET RD	Group B	Well #1	Well	OKANOGAN	3	48.59455	-119.773
SALMON MEADOWS CG - TONASKET RD	Group B	Well #1	Well	OKANOGAN	3	48.65874	-119.843
WASHINGTON PASS WELL - METHOW RD	Transient Non-Community	Washington Pass Well	Well	OKANOGAN	13	48.52446	-120.655
SINLAHEKIN WILDLIFE AREA HDQS.W.S.	Group B	WELL #1	Well	OKANOGAN	71	48.75423	-119.655
SPRING CANYON CAMPGROUND	Transient Non-Community	Spring Canyon Well - AFA218	Well	LINCOLN	200	47.93457	-118.937
CHOPAKA LAKE CAMPGROUND	Group B	Well #1	Well	OKANOGAN	4	48.90765	-119.702
NORTH FORK NINE MILE	Group B	Well #1	Well	OKANOGAN	3	48.84822	-119.851
ROCK CREEK CAMP	Group B	Well #1	Well	OKANOGAN	0	48.41903	-119.757
ALTA LAKE STATE PARK	Transient Non-Community	Well #3	Well	OKANOGAN	100	48.02523	-119.94
CONCONULLY SP PRIMITIVE AREA	Transient Non-Community	Well #1	Well	OKANOGAN	50	48.55115	-119.748
CONCONULLY SP BOAT LAUNCH	Transient Non-Community	Well #1	Well	OKANOGAN	26	48.56488	-119.731
BRIDGEPORT STATE PARK	Transient Non-Community	Well #1	Well	OKANOGAN	60	48.01587	-119.605
Pearrygin Lake State Park - West CG	Transient Non-Community	South B Well	Well	OKANOGAN	35	48.49211	-120.145
Pearrygin Lake State Park - West CG	Transient Non-Community	North A Well	Well	OKANOGAN	50	48.49578	-120.15
CONCONULLY STATE PARK	Transient Non-Community	Well #2	Well	OKANOGAN	42	48.55649	-119.752
CONCONULLY STATE PARK	Transient Non-Community	Well #3	Well	OKANOGAN	100	48.55609	-119.751
PEARRYGIN LAKE STATE PARK	Transient Non-Community	Well #1	Well	OKANOGAN	40	48.48861	-120.148

### **3.8 Air Quality**

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA Forest Service 2000).

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, OAQPS (Organization for Air Quality Protection Standards) is responsible for setting standards, also known as national ambient air quality standards (NAAQS), for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources (Louks 2001).

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in Central and Eastern Washington are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Air quality in the area is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect all communities in Okanogan County.

#### **3.8.1 Washington State Smoke Management Plan**

The Department of Natural Resources (DNR), Department of Ecology (DOE), U.S. Forest Service (USFS), National Park Service (NPS), Bureau of Land Management (BLM), participating Indian nations, military installations (DOD), and small and large forest landowners have worked together to deal with the effect of outdoor burning on air.

Protection of public health and preservation of the natural attractions of the state are high priorities and can be accomplished along with a limited, but necessary, outdoor burning program. Public health, public safety, and forest health can all be served through the application of the provisions of Washington State law and this plan, and with the willingness of those who do outdoor burning on forest lands to further reduce the negative effects of their burning.

The Washington State Smoke Management Plan pertains to DNR-regulated silvicultural outdoor burning only and does not include agricultural outdoor burning or outdoor burning that occurs on improved property. Although the portion of total outdoor burning covered by this plan is less than 10 percent of the total air pollution in Washington, it remains a significant and visible source.

##### **3.8.1.1 Background**

Washington State has had a Smoke Management Plan in effect since 1969. After the enactment of the original plan, and with the addition of the 1975 plan, the number of smoke intrusions into designated population areas has dropped significantly every year.

The 1975 Smoke Management Plan has undergone several informal and semi-formal modifications since its adoption, mainly by agreement with the plan's signatories and other agencies. These modifications represent significant changes in DNR operating procedures and emphases.

The earlier Smoke Management Plans of 1969 and 1975 have done their job well. Today the Pacific Northwest is regarded as a leader in controlling smoke from outdoor burning on forest lands; many other states have used past plans as models in setting up their own smoke management programs.

### **3.8.1.2 Purpose**

The purpose of the Washington State Smoke Management Plan is to coordinate and facilitate the statewide regulation of prescribed outdoor burning on lands protected by the DNR and on unimproved, federally-managed forest lands and participating tribal lands. The plan is designed to meet the requirements of the Washington Clean Air Act.

### **3.8.1.3 Goals**

- Protect human health and safety from the effects of outdoor burning
- Facilitate the enjoyment of the natural attractions of the state
- Provide a limited burning program for the people of this state
- Provide the opportunity for essential forest land burning while minimizing emissions
- Reduce emissions from silvicultural burning other than for forest health reasons first by 20 percent and later by 50 percent, as required by law
- Foster and encourage the development of alternative methods for disposing, of or reducing the amount of, organic refuse on forest lands
- Acknowledge the role of fire in forest ecosystems and allow the use of fire under controlled conditions to maintain healthy forests.

### **3.8.1.4 Scope**

The plan provides regulatory direction, operating procedures, and advisory information regarding the management of smoke and fuels on the forest lands of Washington State. It applies to all persons, landowners, companies, state and federal land management agencies, and others who do outdoor burning in Washington State on lands where the DNR provides fire protection, or where such burning occurs on federally-managed, unimproved forest lands and tribal lands of participating Indian nations in the state.

The plan does not apply to agricultural outdoor burning and open burning as defined by Washington Administrative Code (WAC) 173-425-030 (1) and (2), nor to burning done "by rule" under WAC 332-24 or on non-forested wildlands (e.g., range lands). All future reference to burning in this plan will refer only to silvicultural burning unless otherwise indicated.

The plan does not address nor attempt to regulate prescribed natural fire in wilderness areas and national parks for several reasons: the amount of emissions caused by such burning in Washington is relatively small, it is impossible to "regulate" unforecastable natural ignitions, and it is nearly impossible to gather emission data efficiently in the areas where this type of burning

generally takes place. Federal agencies that have adopted the use of prescribed natural fires will remain solely responsible for the administration of such programs.

#### **3.8.1.5 Participation**

Those who receive fire protection from the DNR, or from agencies contracted by the DNR, must abide by the requirements of this plan. This includes all burning done on private and state-managed lands that pay, or are subject to paying, Forest Protection Assessment.

Federal agencies that do outdoor burning on forest lands must participate in and abide by the requirements of this plan under the direction of the federal Clean Air Act. These agencies include, but are not limited to, the Forest Service (USFS), Park Service (NPS), Fish and Wildlife Service (F&WS), Bureau of Land Management (BLM), and Department of Defense (DOD).

Indian nations may choose to participate in all or portions of the plan. Participation would be by written agreement between the Indian nation and the DNR. Advantages of participation by Indian nations would include statewide coordination of burning, shared weather forecasting services, uniform data reporting and storage, better protection of the public through a unified burn approval system, satisfaction of federal EPA requirements, and other services provided by either party to the other. Such future agreements would become appendices to this plan.



## Chapter 4: Risk and Preparedness Assessments

### 4 Overview

#### 4.1 *Wildland Fire Characteristics*

An informed discussion of fire mitigation is not complete until basic concepts that govern fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn; the manner in which fuels ignite, how flames develop and how fire spreads across the landscape. The three major physical components that determine fire behavior are the fuels supporting the fire, topography in which the fire is burning, and the weather and atmospheric conditions during a fire event. At the landscape level, both topography and weather are beyond our control. We are powerless to control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment; fuels which support the fire. By altering fuel loading and fuel continuity across the landscape, we have the best opportunity to determine how fires burn.

A brief description of each of the fire environment elements follows in order to illustrate their effect on fire behavior.

##### 4.1.1 Weather

Weather conditions contribute significantly to determining fire behavior. Wind, moisture, temperature, and relative humidity ultimately determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions are capable of sustaining a fire, atmospheric stability and wind speed and direction can have a significant affect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

##### 4.1.2 Topography

Fires burning in similar fuel conditions burn dramatically different under different topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influence vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. These slopes also tend to be on the windward side of mountains. Thus these slopes tend to be “available to burn” a greater portion of the year.

Slope also plays a significant roll in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

### **4.1.3 Fuels**

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and buildings are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content and continuity and arrangement all have an affect on fire behavior. Generally speaking, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, “fine” fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grass fires burn. As fuel size increases, the rate of spread tends to decrease, as surface to volume ratio decreases. Fires in large fuels generally burn at a slower rate, but release much more energy, burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potentially development of crown fire. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determine how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected affect small changes in any single component has on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, some of the principles that govern fire behavior have been identified and are recognized.

## **4.2 Wildfire Hazards**

### **4.2.1 Wildfire Ignition Profile**

Fire was once an integral function of the majority of ecosystems in Washington. The seasonal cycling of fire across the landscape was as regular as the July, August and September lightning storms plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition (Johnson 1998). The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals (Barrett 1979). With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age (Johnson *et al.* 1994). Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation in the Columbia Basin for thousands of years (Steele *et al.* 1986, Agee 1993).

Detailed records of fire ignition and extent have been compiled by the Washington Department of Natural Resources of fire ignitions dating from 1972 to 2006. The Confederated Tribes of the Colville Reservation maintain detailed fire ignition and extent data for this region from 1983 to 2004. In addition the U.S. Forest Service has also maintained a database of fire ignitions and extent on their jurisdiction in Okanogan County from 1910 thru 2001. Using these data on past

fire extents and fire ignition data, the occurrence of wildland fires in the region of Okanogan County has been evaluated.

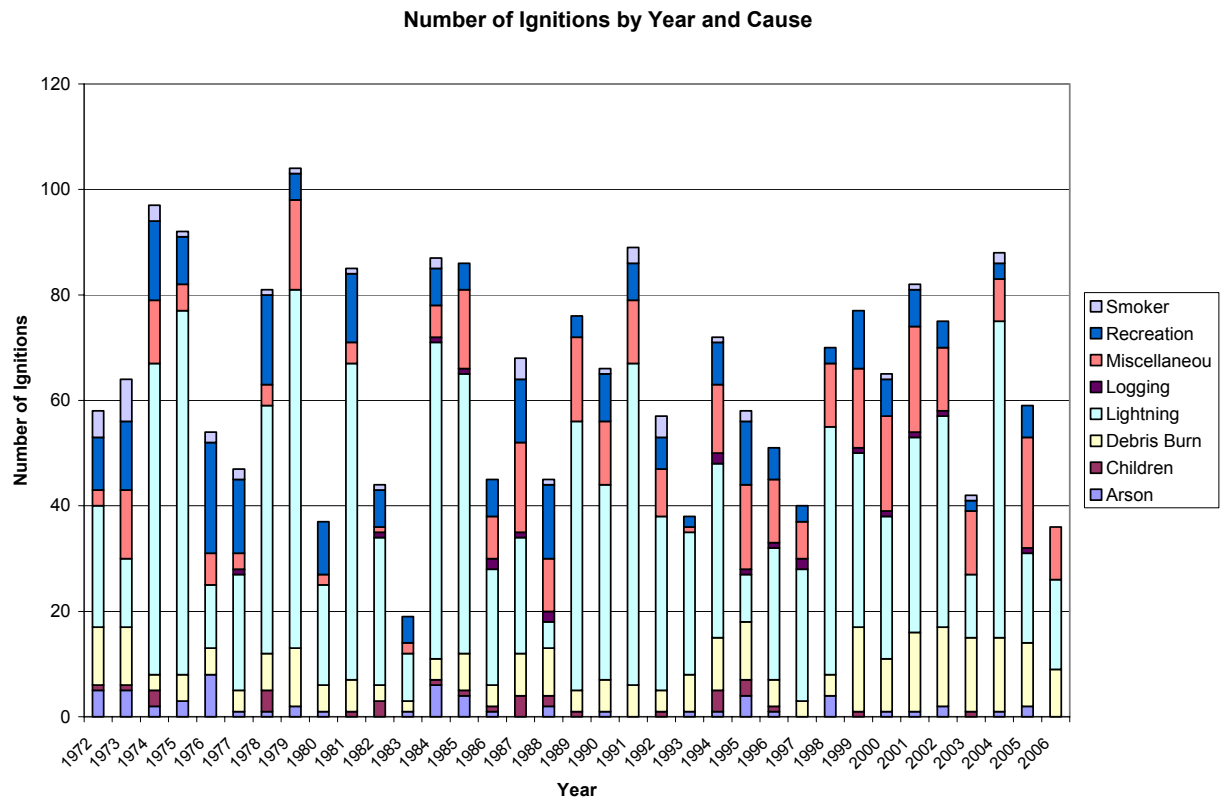
The Washington Department of Natural Resources database of wildfire ignitions for those areas where the Washington Department of Natural Resources provides primary wildfire suppression services includes data from 1972 through 2006. An analysis of the wildfire ignitions in Okanogan County reveals that during this period approximately 113,604 acres have burned as a result of 2,254 wildfire ignitions in Okanogan County on DNR protected lands (4.1).

**Table 4.1. Summary of wildfire ignitions in Okanogan County from the Washington Department of Natural Resources database.**

<b>Cause</b>	<b>Acres Burned</b>	<b>Percent</b>	<b>Number of Ignitions</b>	<b>Percent</b>
Children	1,598	1%	34	2%
Debris Burning	7,716	7%	270	12%
Arson	444	0%	61	3%
Lightning	64,585	57%	1,182	52%
Logging	12	0%	20	1%
Miscellaneous	34,259	30%	354	16%
Recreation	3,896	3%	285	13%
Smoker	1,093	1%	48	2%
<b>Total</b>	<b>113,604</b>	<b>100%</b>	<b>2,254</b>	<b>100%</b>

The “Miscellaneous” category includes ignitions originating from structure fires, burning material from aircraft, burning material from auto (other than smoking), burning vehicle, electric fence, equipment crash, fireworks (other than children), hot ashes, power lines, sparks from auto exhaust, sparks from cutting torch or welder, sparks from farm tractors, spontaneous combustion (other than sawdust piles), use of fire (other than logging), woodcutting, and an “other” category

**Figure 4.1. Wildfire Ignitions within DNR Protection Area 19720-2006.**



**Table 4.2. Wildfire Ignition and Extent Summary by Year within the DNR Protection Area.**

Year	Acres Burned by Year	Number of Ignitions
1972	281	58
1973	3,313	64
1974	717	97
1975	296	92
1976	2,527	54
1977	1,886	47
1978	46	81
1979	8,490	104
1980	555	37
1981	2,083	85
1982	210	44
1983	9	19
1984	327	87
1985	31,100	86
1986	599	45
1987	2,015	68
1988	486	45

**Table 4.2. Wildfire Ignition and Extent Summary by Year within the DNR Protection Area.**

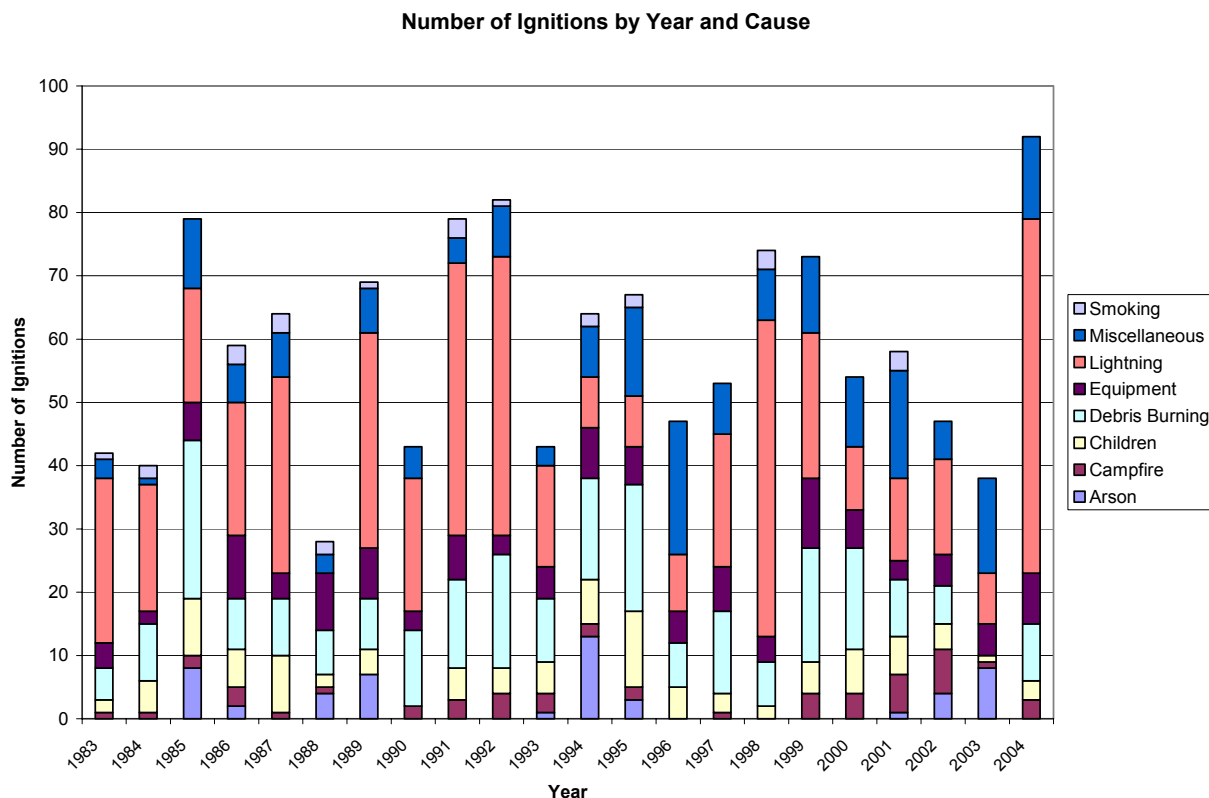
<b>Year</b>	<b>Acres Burned by Year</b>	<b>Number of Ignitions</b>
1989	6,308	76
1990	229	66
1991	1,744	89
1992	927	57
1993	139	38
1994	13,034	72
1995	2,298	58
1996	121	51
1997	9	40
1998	682	70
1999	3,698	77
2000	13,465	65
2001	7,046	82
2002	2,736	75
2003	1,982	42
2004	871	88
2005	3,349	59
2006	28	36
<b>Total</b>	<b>113,604</b>	<b>2,254</b>

The Confederated Tribes of the Colville Reservation has maintained detailed records for the areas where they provide primary wildfire suppression services for the period of 1983 - 2004. Within the Colville Reservation in Okanogan County, approximately 1,295 ignitions have been recorded since 1983 (Figure 4.2, Table 4.3).

**Table 4.3. Summary of wildfire ignitions in Okanogan County from the Confederated Tribes of the Colville Reservation database.**

<b>Cause</b>	<b>Number of Ignitions</b>	<b>Percent</b>
Arson	51	4%
Campfire	51	4%
Children	106	8%
Debris Burning	246	19%
Equipment	129	10%
Lightning	495	38%
Miscellaneous	191	15%
Smoking	26	2%
<b>Total</b>	<b>1,295</b>	<b>100%</b>

**Figure 4.2. Wildfire Ignitions within Colville Reservation 1983 - 2004.**



Rather than report the specific size of each fire, the Colville Tribe records fires by size class. Table 4.4 shows how size classes are determined.

**Table 4.4. Description of Fire Size Classes.**

Size Class	Description
A	0-0.25 Acres
B	0.26-9 Acres
C	10-99 Acres
D	100-299 Acres
E	300-999 Acres
F	1,000-4,999 Acres
G	5,000 Acres or more

Using an average value from each size class, approximately 116,475 acres have been burned on the Colville Reservation between 1983 and 2004. Table 4.5 shows the number of ignitions by size class.

**Table 4.5. Wildfire Ignition Summary by Year within the Colville Reservation.**

Size Class	Number of Ignitions	Percent
A	613	47%
B	510	39%

**Table 4.5. Wildfire Ignition Summary by Year within the Colville Reservation.**

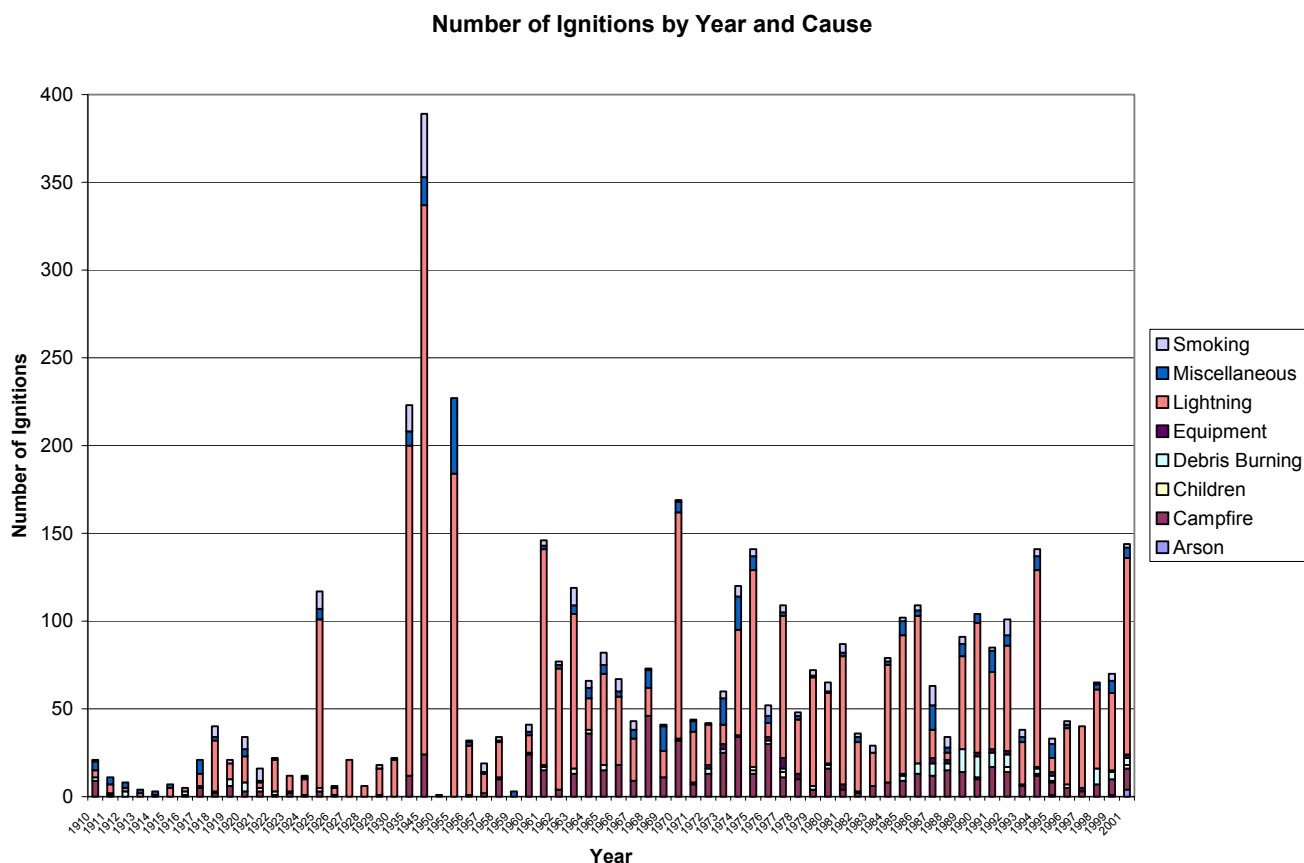
<b>Size Class</b>	<b>Number of Ignitions</b>	<b>Percent</b>
C	104	8%
D	19	1%
E	24	2%
F	18	1%
G	7	1%
<b>Total</b>	<b>1,295</b>	<b>100</b>

The U.S. Forest Service has maintained an extensive database for the areas where they provide primary wildfire suppression services for the period of 1910 - 2001. Within the National Forests in Okanogan County, approximately 4,526 ignitions have been recorded since 1910 (Figure 4.3, Table 4.6).

**Table 4.6. Summary of wildfire ignitions in Okanogan County from the U.S. Forest Service database.**

<b>Cause</b>	<b>Number of Ignitions</b>	<b>Percent</b>
Arson	6	0%
Campfire	659	15%
Children	13	0%
Debris Burning	140	3%
Equipment	45	1%
Lightning	3,080	68%
Miscellaneous	334	7%
Smoking	249	6%
<b>Total</b>	<b>4,526</b>	<b>100%</b>

**Figure 4.3. Wildfire Ignitions recorded by U.S. Forest Service from 1910-2001.**



Rather than report the specific size of each fire, the U.S. Forest Service has recorded fires by size class in Okanogan County. Table 4.7 shows how size classes are determined.

**Table 4.7. Description of Fire Size Classes.**

Size Class	Description
A	0-0.25 Acres
B	0.26-9 Acres
C	10-99 Acres
D	100-299 Acres
E	300-999 Acres
F	1,000-4,999 Acres
G	5,000 Acres or more

Using an average value from each size class, approximately 97,650 acres have been burned on the National Forests in Okanogan County between 1910 and 2001. Table 4.8 shows the number of ignitions by size class.



**Table 4.8. Wildfire Ignition Summary by Year within the Colville Reservation.**

Size Class	Number of Ignitions	Percent
A	3,519	78%
B	737	16%
C	196	4%
D	31	1%
E	23	1%
F	14	0%
G	4	0%
<b>Total</b>	<b>4,524</b>	<b>100%</b>

Combining the ignition data from the DNR, the Confederated Tribes of the Colville Reservation, and the U.S. Forest Service shows that there were 3,679 total ignitions in Okanogan County between the years of 1983-2001 for which there is common data from all three sources. However, the above tables articulate that throughout their data ranges only 1,073 acres per year are burned on Forest Service ownerships while 3,341 acres per year are burned on DNR lands and 5,546 acres are burned per year on the Colville Reservation in Okanogan County.

The above data also illustrates that lightning plays a major role in the wildfire starts and total acres burned across all ownerships. Human caused ignitions as a result of campfires, debris burning also cause a significant amount of ignitions throughout all ownerships every year.

In all analyses, Okanogan County is heavily impacted by wildland fire

## 4.2.2 Wildfire Extent Profile

Across the west, wildfires have been increasing in extent and cost of control. The National Interagency Fire Center (2005) reported over 77,500 wildfires in 2004 which burned a total of 6.7 million acres and cost \$890 million in containment (Table 4.9). Data summaries for 2000 through 2004 are provided and demonstrate the variability of the frequency and extent of wildfires nationally (Table 4.10). It is important to note that the 10 year moving average number of acres burned reported each year has been increasing constantly since 2000.

**Table 4.9. National Fire Season Summaries.**

Statistical Highlights	2000	2001	2002	2003	2004
Number of Fires	122,827	84,079	88,458	85,943	77,534
10-year Average ending with indicated year	106,393	106,400	103,112	101,575	100,466
Acres Burned	<b>8,422,237</b>	<b>3,555,138</b>	<b>6,937,584</b>	<b>4,918,088</b>	<b>6,790,692</b>
10-year Average ending with indicated year	3,786,411	4,083,347	4,215,089	4,663,081	4,923,848
Structures Burned	861	731	2,381	5,781	1,095
Estimated Cost of Fire Suppression (Federal agencies only)	\$1.3 billion	\$917 million	\$ 1.6 billion	\$1.3 billion	\$890 million

The National Interagency Fire Center, located in Boise, Idaho, maintains records of fire costs, extent, and related data for the entire nation. Tables 4.10 and 4.11 summarize some of the relevant wildland fire data for the nation, and some trends that are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained.

These statistics are based on end-of-year reports compiled by all wildland fire agencies after each fire season, and are updated by March of each year. The agencies include: Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, USDA Forest Service and all State Lands.

**Table 4.10. Total Fires and Acres 1960 - 2004 Nationally.**

Year	Fires	Acres	Year	Fires	Acres
2004	77,534	* 6,790,692	1981	249,370	4,814,206
2003	85,943	4,918,088	1980	234,892	5,260,825
2002	88,458	6,937,584	1979	163,196	2,986,826
2001	84,079	3,555,138	1978	218,842	3,910,913
2000	122,827	8,422,237	1977	173,998	3,152,644
1999	93,702	5,661,976	1976	241,699	5,109,926
1998	81,043	2,329,709	1975	134,872	1,791,327
1997	89,517	3,672,616	1974	145,868	2,879,095
1996	115,025	6,701,390	1973	117,957	1,915,273
1995	130,019	2,315,730	1972	124,554	2,641,166
1994	114,049	4,724,014	1971	108,398	4,278,472
1993	97,031	2,310,420	1970	121,736	3,278,565
1992	103,830	2,457,665	1969	113,351	6,689,081
1991	116,953	2,237,714	1968	125,371	4,231,996
1990	122,763	5,452,874	1967	125,025	4,658,586
1989	121,714	3,261,732	1966	122,500	4,574,389
1988	154,573	7,398,889	1965	113,684	2,652,112
1987	143,877	4,152,575	1964	116,358	4,197,309
1986	139,980	3,308,133	1963	164,183	7,120,768
1985	133,840	4,434,748	1962	115,345	4,078,894
1984	118,636	2,266,134	1961	98,517	3,036,219
1983	161,649	5,080,553	1960	103,387	4,478,188
1982	174,755	2,382,036			

(National Interagency Fire Center 2004)

**Table 4.11. Suppression Costs for Federal Agencies Nationally.**

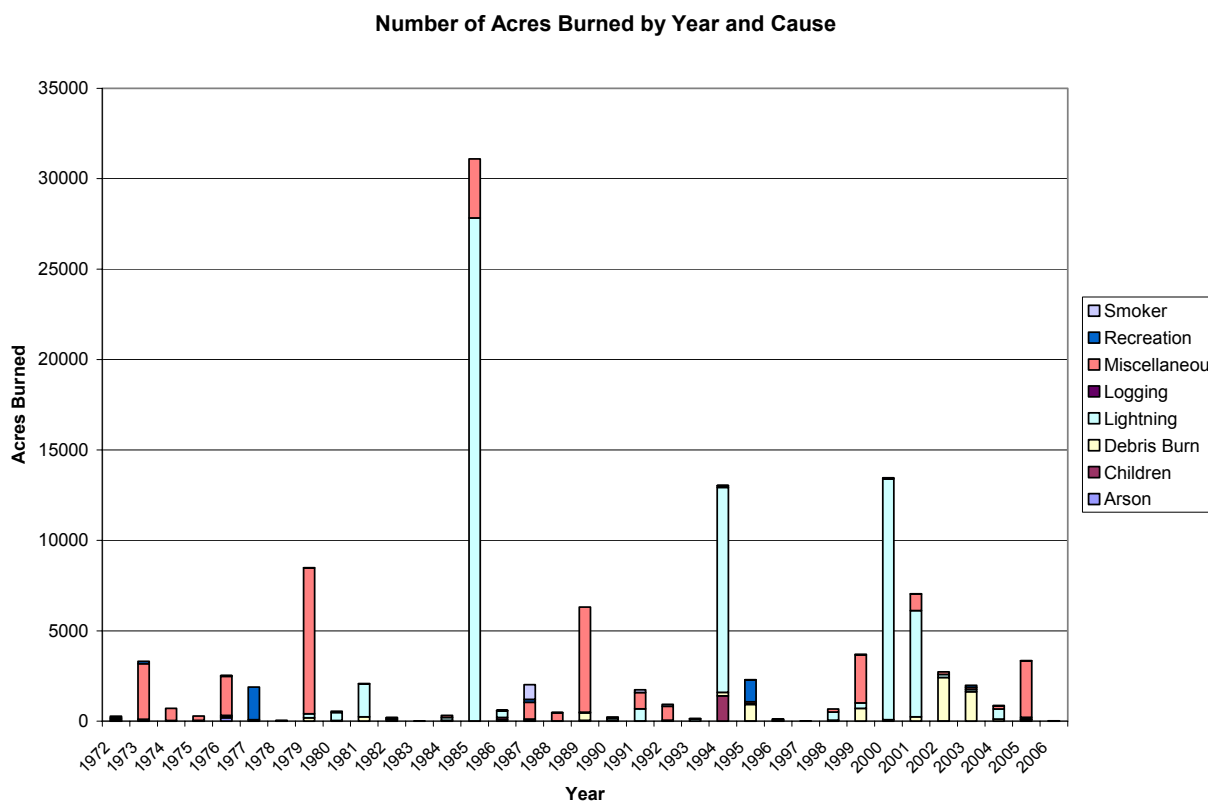
Year	Bureau of Land Management	Bureau of Indian Affairs	Fish and Wildlife Service	National Park Service	USDA Forest Service	Totals
2004	\$ 147,165,000	\$ 63,452,000	\$ 7,979,000	\$ 34,052,000	\$ 637,585,000	<b>\$890,233,000</b>
2003	\$151,894,000	\$ 96,633,000	\$ 9,554,000	\$ 44,557,000	\$ 1,023,500,000	<b>\$1,326,138,000</b>
2002	\$ 204,666,000	\$ 109,035,000	\$ 15,245,000	\$ 66,094,000	\$ 1,266,274,000	<b>\$1,661,314,000</b>
2001	\$ 192,115,00	\$ 63,200,000	\$ 7,160,000	\$ 48,092,000	\$ 607,233,000	<b>\$917,800,000</b>
2000	\$180,567,000	\$ 93,042,000	\$ 9,417,000	\$ 53,341,000	\$ 1,026,000,000	<b>\$1,362,367,000</b>
1999	\$ 85,724,000	\$ 42,183,000	\$ 4,500,000	\$ 30,061,000	\$ 361,000,000	<b>\$523,468,000</b>
1998	\$ 63,177,000	\$ 27,366,000	\$ 3,800,000	\$ 19,183,000	\$ 215,000,000	<b>\$328,526,000</b>
1997	\$ 62,470,000	\$ 30,916,000	\$ 2,000	\$ 6,844,000	\$ 155,768,000	<b>\$256,000,000</b>
1996	\$ 96,854,000	\$ 40,779,000	\$ 2,600	\$ 19,832,000	\$ 521,700,000	<b>\$679,167,600</b>
1995	\$ 56,600,000	\$ 36,219,000	\$ 1,675,000	\$ 21,256,000	\$ 224,300,000	<b>\$340,050,000</b>
1994	\$ 98,417,000	\$ 49,202,000	\$ 3,281,000	\$ 16,362,000	\$ 678,000,000	<b>\$845,262,000</b>

(National Interagency Fire Center 2005)

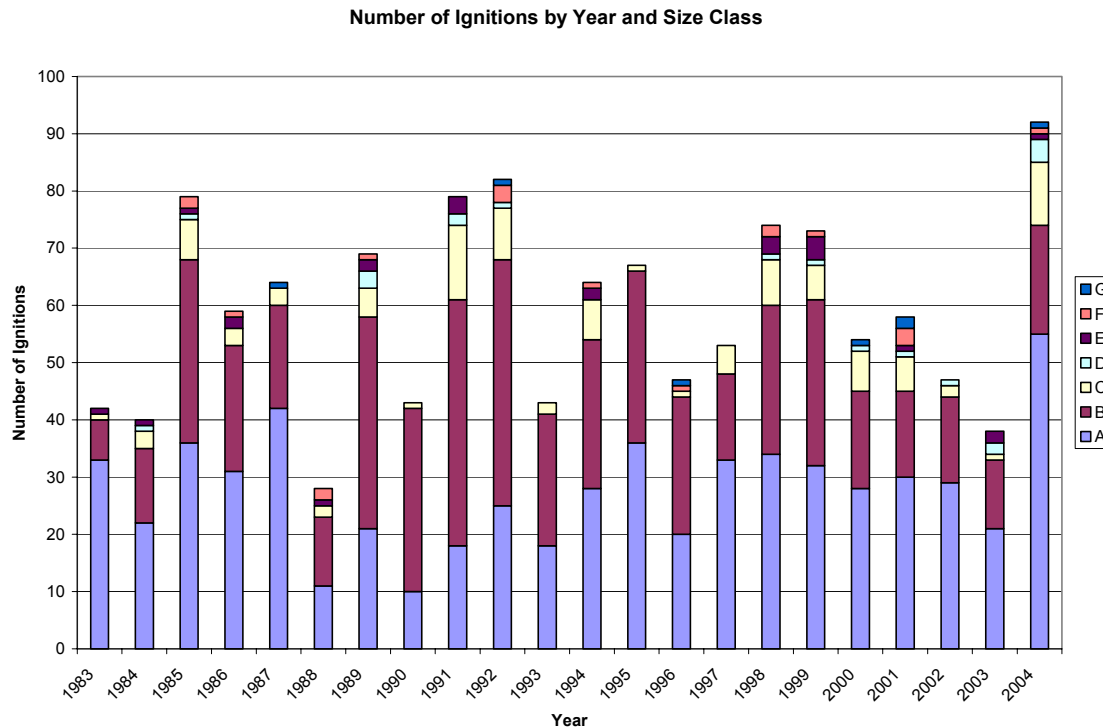
Figure 4.4 below shows the extent of wildfires by acreage burned per year in Okanogan County. The various fire suppression agencies in Okanogan County respond to many wildland fires each

year, but few of those fires grow to a significant size. According to national statistics, only 2% of all wildland fires escape initial attack. However, that 2% accounts for the majority of fire suppression expenditures, which also threaten lives, properties, and natural resources. These large fires are characterized by a size and complexity that requires special management organizations, drawing suppression resources often from across the nation. It is these big fires that gobble acres and leave the most lasting effects. They create unique challenges to local communities by their quick development and the scale of their footprint. Okanogan County is located within an area where natural vegetation and weather combine to make dangerous fire conditions. Natural ignitions from lightning have been part of the history of the County and will continue to be. Even though firefighters understand this potential, it is impossible for agencies to guarantee 100% success in fire suppression. It is important for fire planners to understand what has happened in the past in order to be more effective in the future when preparing for the inevitable.

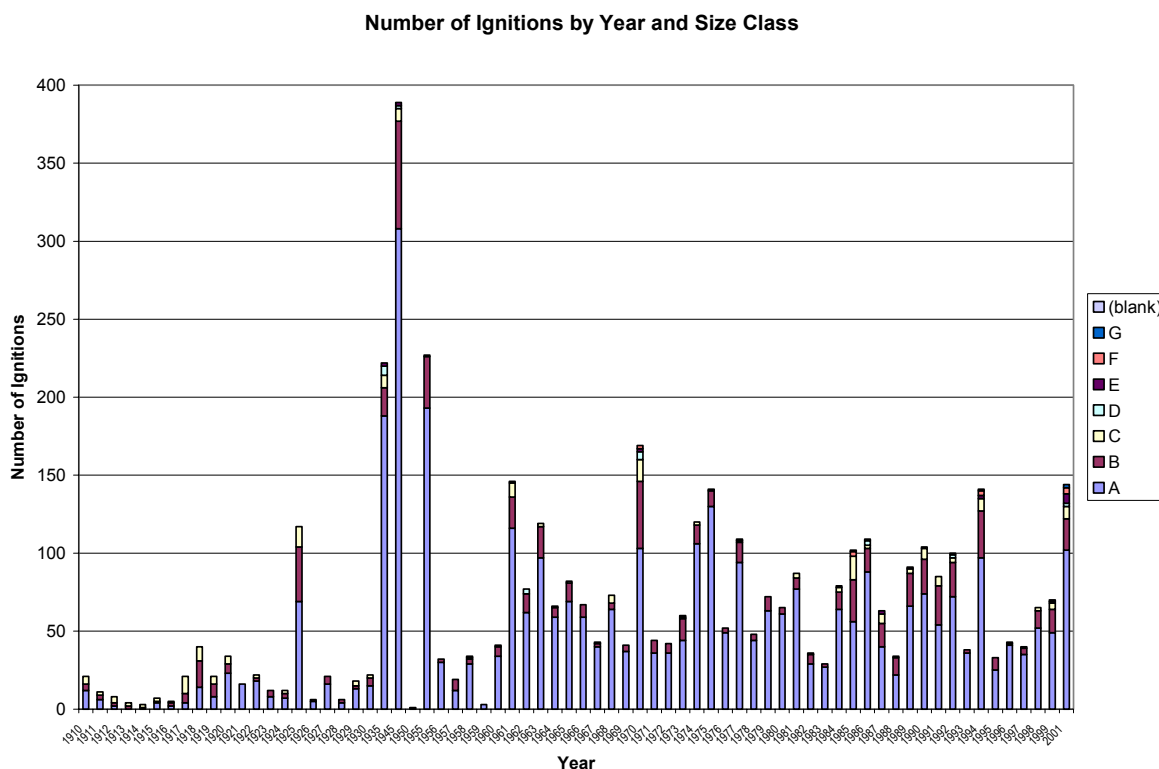
**Figure 4.4. Acres burned in DNR Protection Areas 1972-2006.**



**Figure 4.5. Number of Ignitions by Size Class on Colville Reservation 1983-2004.**



**Figure 4.6. Number of Ignitions by Size Class recorded by U.S. Forest Service 1910-2001.**



### 4.2.3 Narrative of Past Wildfire Events in Okanogan County

The Tripod Fire was ignited by lightning on July 24<sup>th</sup>, 2006 and consumed over 175,000 acres of mostly Forest Service and State managed forestland in Okanogan County. The majority of the burned area was in heavy timber with vast amounts of beetle killed lodgepole pine, spruce, Douglas-fir, and subalpine fir. Accumulations of dead and down fuel as well as overcrowded conditions caused this fire to burn very intensely, primarily as a running crown fire, for over two months. Suppression of the Tripod Fire was very difficult due to the density of fuels, extreme fire behavior, rugged terrain, and lack of access. Wide fire lines and back burns were conducted well in front of the fire front in an attempt to keep the blaze away from communities and to push it towards previously burned areas which had less fuel loading. In October of 2006, the wet fall weather eventually put the Tripod Fire out; however, the communities of Loomis, Conconully, Mazama, Twisp, and Winthrop were all threatened at some point throughout the course of this burn.

The latest reports from the Forest Service declared the total suppression costs of the fire to be \$74 million with an additional \$28.3 million requested for rehabilitation. However, this does not include the economic loss and hardship on Okanogan County. The Tripod Fire necessitated closure of many campsites, trails, and other recreational areas; thereby, eliminating some of the tourism draw to the County. The resort town of Conconully is probably the most impacted as the town spent much of this time under a Level II Evacuation notice. The economic loss to the town has not yet been reported. Additionally, dense smoke settling in the Okanogan River and Methow River valleys caused air quality ratings to be declared "Hazardous". Asthma sufferers and the elderly were severely impacted by this as many were confined to the indoors or had to leave the area completely for several days or weeks.

Nearly 250,000 total acres burned in Okanogan County alone in 2006. In comparison, 275,000 total acres burned in Okanogan County between 2001 and 2005. In this five year period, \$65 million was spent on fire suppression compared to the \$74 million spent on the Tripod Fire alone in 2006.

Okanogan County has been hit by several large fires in the past (Table 4.12) and will continue to experience them in the future. A steadily influx of new construction occurring in many rural and high fire potential parts of the County has resulted in increasing fire risk. This is very likely to eventually lead to the loss of life and property unless drastic measures are taken to reduce the wildland fire risk around homes, infrastructure, and in the surrounding forest and rangelands.

**Table 4.12. Selected Recent Fires in Okanogan County.**

<b>Fire Name</b>	<b>Year</b>	<b>Acres</b>	<b>Approximate Cost<sup>1</sup></b>
Goose Lake	2001	1,282	552,542
Bailey	2001	3,223	66,213
Libby South	2001	3,516	718,621
Gambles Mill	2001	5,392	229,292
Thirtymile	2001	10,331	2,062,922
St. Mary's Mission	2001	36,659	4,502
Virginia Lake	2001	36,659	
Quartz Mountain	2002	4,202	15,619
Middle Quartz Mountain	2002	7,392	
Isabel	2003	4,262	8,073,276
Needles	2003	28,159	11,602,772

**Table 4.12. Selected Recent Fires in Okanogan County.**

<b>Fire Name</b>	<b>Year</b>	<b>Acres</b>	<b>Approximate Cost<sup>1</sup></b>
Farewell	2003	81,061	35,087,005
Williams Butte	2004	1,257	3,847,659
Squaw Creek	2005	1,007	989,038
Burnt Bread	2005	1,352	2,912,221
Second HUD	2005	4,176	200,687
West Lake Omak	2005	11,265	4,855,215
Total		275,566	64,795,701

<sup>1</sup>Approximate cost based on \$431 per acre average suppression cost.

### **4.3 Wildfire Hazard Assessment**

Okanogan County and the adjacent County of Ferry, were analyzed using a variety of techniques, managed on a GIS system (ArcGIS 8.2). Physical features of the region were represented by data layers including roads, streams, soils, elevation, and remotely sensed images. Field visits were conducted by specialists from Northwest Management, Inc., and others. Discussions with area residents and fire control specialists augmented field visits and provided insights to forest health issues and treatment options.

This information was analyzed and combined to develop an assessment of wildland fire risk in the region.

#### **4.3.1 Fire Prone Landscapes**

Schlosser *et al.* 2002, developed a methodology to assess the location of fire prone landscapes on forested and non-forested ecosystems in the western US. Northwest Management, Inc. has completed similar assessments on over 35 counties and Indian Reservations in Idaho, Montana, Nevada, and Washington to determine fire prone landscape characteristics.

The goal of developing the Fire Prone Landscapes analysis is to make inferences about the relative risk factors across large geographical regions (multiple counties) for wildfire spread. This analysis uses the extent and occurrence of past fires as an indicator of characteristics for a specific area and their propensity to burn in the future. Concisely, if a certain combination of vegetation cover type, canopy closure, aspect, slope, stream and road density have burned with a high occurrence and frequently in the past, then it is reasonable to extrapolate that they will have the same tendency in the future, unless mitigation activities are conducted to reduce this potential.

The analysis for determining those landscapes prone to wildfire utilized a variety of sources.

**Digital Elevation:** Digital elevation models (DEM) for this project used USGS 10 meter DEM data provided at quarter-quadrangle extents. These were merged together to create a continuous elevation model of the analysis area.

The merged DEM file was used to create two derivative data layers; aspect and slope. Both were created using the spatial analyst extension in ArcGIS 8.2. Aspect data values retained one decimal point accuracy representing the cardinal direction of direct solar radiation, represented in degrees. Slope was recorded in degrees and retained two decimal points accuracy.

**Remotely Sensed Images:** Landsat 7 Enhanced Thematic Mapper (ETM+) images were used to assess plant cover information and percent of canopy cover. The Landsat ETM+ instrument is an eight-band multi-spectral scanning radiometer capable of providing high-resolution image

information of the Earth's surface. It detects spectrally-filtered radiation at visible, near-infrared, short-wave, and thermal infrared frequency bands from the sun-lit Earth. Nominal ground sample distances or "pixel" sizes are 15 meters in the panchromatic band; 30 meters in the 6 visible, near and short-wave infrared bands; and 60 meters in the thermal infrared band.

The satellite orbits the Earth at an altitude of approximately 705 kilometers with a sun-synchronous 98-degree inclination and a descending equatorial crossing time of 10 a.m. daily.

Image spectrometry has great application for monitoring vegetation and biophysical characteristics. Vegetation reflectance often contains information on the vegetation chlorophyll absorption bands in the visible region and the near infrared region. Plant water absorption is easily identified in the middle infrared bands. In addition, exposed soil, rock, and non-vegetative surfaces are easily separated from vegetation through standard hyper-spectral analysis procedures.

Two Landsat 7 ETM images were obtained to conduct hyper-spectral analysis for this project. The first was obtained in 1998 and the second in 2002. Hyper-spectral analysis procedures followed the conventions used by the Idaho Vegetation and Land Cover Classification System, modified from Redmond (1997) and Homer (1998).

**Riparian Zones:** Riparian zones were derived from stream layers created during the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).


**Wind Direction:** Wind direction and speed data detailed by monthly averages was used in this project to better ascertain certain fire behavior characteristics common to large fire events. These data are spatially gridded Average Monthly Wind Directions in Idaho. The coverage was created from data summarized from the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

**Past Fires:** Past fire extents represent those locations on the landscape that have previously burned during a wildfire. Past fire extent maps were obtained from a variety of sources for the North Central Washington area including the USDA Forest Service and Washington Department of Natural Resources.

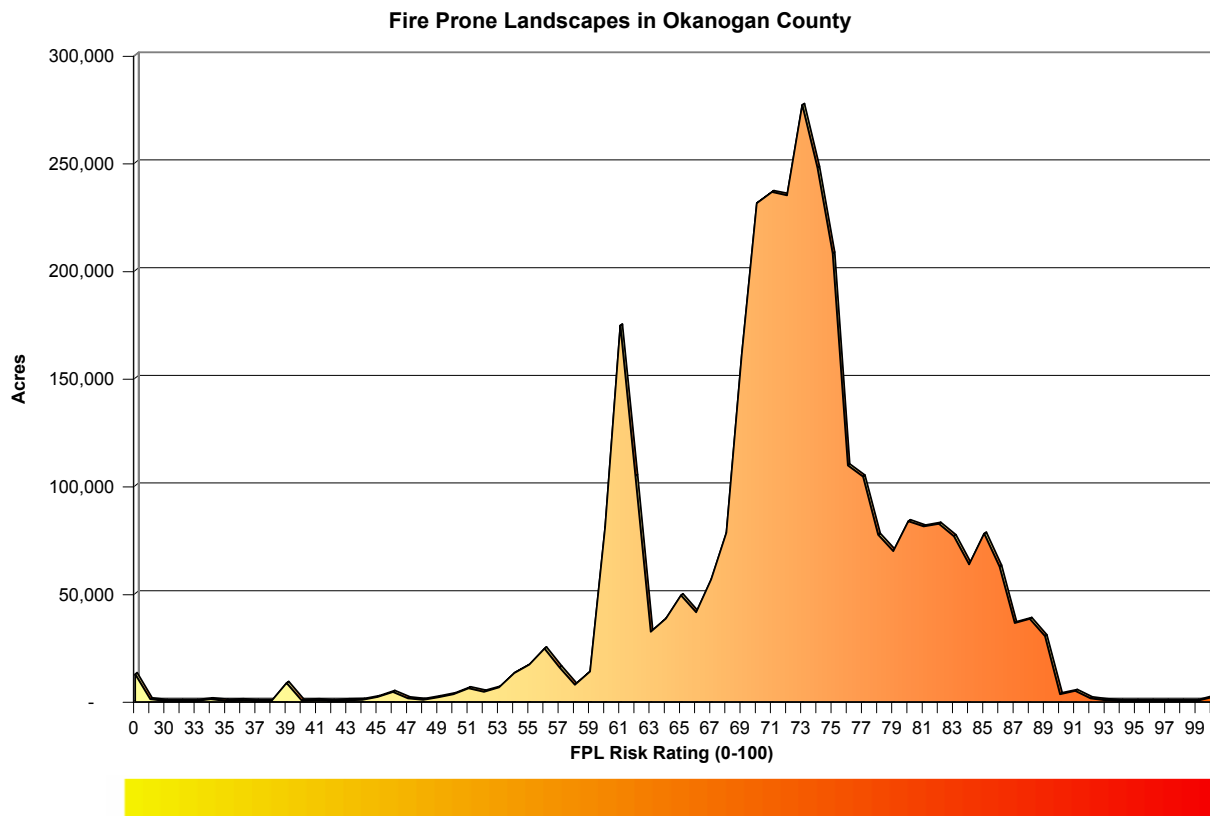
**Fire Prone Landscapes:** Using the methodology developed by Schlosser *et al.* (2002, 2003, 2004), and refined for this project, the factors detailed above were used to assess the potential for the landscape to burn during the fire season in the case of fire ignition. Specifically, the entire region was evaluated at a resolution of 10 meters (meaning each pixel on the screen represented a 10 meter square on the ground) to determine the propensity for a particular area (pixel) to burn in the case of a wildfire. The analysis involved creating a linear regression analysis within the GIS program structure to assign a value to each significant variable, pixel-by-pixel. The analysis ranked factors from 0 (little to no risk) to 100 (extremely high risk) based on past fire occurrence.

A map of Fire Prone Landscapes in Okanogan County is included in Appendix I.

**Table 4.13. Fire Prone Landscape rankings and associated acres in each category for Okanogan County.**

Color Code	Value	Total Acres	Percent of Total Area
	0	12,477	0%
	10	-	0%
	20	-	0%
	30	890	0%
	40	9,668	0%
	50	14,031	0%
	60	188,531	6%
	70	966,616	28%
	80	1,647,789	48%
	90	551,046	16%
	100	8,367	0%

**Figure 4.7. Distribution of Fire Prone Landscapes in Okanogan County by ranking scale.**



The risk category values developed in this analysis should be considered **ordinal data**, that is, while the values presented have a meaningful ranking, they neither have a true zero point nor scale between numbers. Rating in the “40” range is not necessarily twice as “risky” as rating in the “20” range. These category values also do not correspond to a rate of fire spread, a fuel loading indicator, or measurable potential fire intensity. Each of those scales is greatly influenced by weather, seasonal and daily variations in moisture (relative humidity), solar



radiation, and other factors. The risk rating presented here serves to identify where certain constant variables are present, aiding in identifying where fires typically spread into the largest fires across the landscape.

Neighborhoods in Okanogan County (see Section 4.7 for descriptions of neighborhoods) were ranked to help the various land management agencies prioritize their wildfire hazard mitigation activities according to the highest risk areas. The average pixel value of the Fire Prone Landscapes analysis within that neighborhood was used to rank each neighborhood. Neighborhoods with an average Fire Prone Landscapes value of greater than 70 were ranked as #1 priorities, neighborhoods with average values from 69 to 70 were given a #2 priority, and neighborhoods with an average value less than 69 were given a #3 priority (Table 4.14).

**Table 4.14. Neighborhood Ranking based on Fire Prone Landscapes.**

Neighborhood	Average Fire Prone Landscapes Value	Ranking
Aeneas Valley	72	1
Brewster/Pateros	67	3
Chewuch	72	1
Conconully	69	2
Cook Mountain	70	2
Coulee Dam	67	3
Crumbacher	68	3
Disautel	70	2
Happy Hill	70	2
Havillah	71	1
Loomis	70	2
Lower Methow	71	1
Malott	68	3
Mazama	74	1
Molson-Chesaw	71	1
Mount Hull	69	2
Nespelem	67	3
Nine Mile	71	1
Omak-Okanogan	65	3
Oroville	54	3
Palmer	56	3
Pine Mountain	70	2
Pontiac Ridge	73	1
Similkameen	69	2
Timentwa	66	3
Tonasket	67	3
Tunk-Chewiliken	70	2
Twisp River	74	1
Twisp-Carlton	72	1
Wannacut	70	2
Wauconda	72	1
Winthrop	67	3

**Table 4.14. Neighborhood Ranking based on Fire Prone Landscapes.**

Neighborhood	Average Fire Prone Landscapes Value	Ranking
Wolf Creek	71	1

### **4.3.2 Historic Fire Regime**

In the fire-adapted ecosystems of Washington, fire is undoubtedly the dominant process in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes (that is, fire frequency and fire severity prior to settlement by Euro-Americans) to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Obviously, historical fire regimes are a critical component for characterizing the historical range of variability in the fire-adapted ecosystems of Washington. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

A database of fire history studies in the region was used to develop modeling rules for predicting historical fire regimes (HFRs). Tabular fire-history data and spatial data was stratified into ecoregions, potential natural vegetation types (PNVs), slope classes, and aspect classes to derive rule sets which were then modeled spatially. Expert opinion was substituted for a stratum when empirical data was not available.

Fire is the dominant disturbance process that manipulates vegetation patterns in Washington. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales. The HFR theme was derived specifically to estimate an index of the relative change of a disturbance process, and the subsequent patterns of vegetation composition and structure.

#### **4.3.2.1 General Limitations**

These data were derived using fire history data from a variety of different sources. These data were designed to characterize broad scale patterns of historical fire regimes for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Because the resolution of the HFR theme is 1,000 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

**Table 4.15. Assessment of Historic Fire Regimes in Okanogan County.**

Description	Acres	Percent
0-35 yrs; Low Severity	834,491	24.5%
0-35 yrs; Stand Replacement	946,243	27.8%
200+ yrs; Stand Replacement	759,206	22.3%
35-100+ yrs; Mixed Severity	416,893	12.3%
35-100+ yrs; Stand Replacement	438,067	12.9%
Water	6,352	0.2%
<b>Total</b>	<b>3,401,252</b>	<b>100.0%</b>

A map of Historic Fire Regimes in Okanogan County is included in Appendix I.

The U.S. Forest Service has updated and corrected the Historic Fire Regime data on their lands in Okanogan County. Where this updated data is available, the resolution is higher and in some cases, has been field verified. The U.S. Forest Service data has been mapped and is also available in Appendix I.

**Table 4.16. Assessment of Historic Fire Regimes on U.S. Forest Service land in Okanogan County.**

Description	Acres	Percent
< 35 years, non-lethal	481,441	31%
< 35 years, stand replacement	92,433	6%
35-100 years, mixed severity	92,451	6%
35-100+ years, stand replacing	301,135	19%
100+ years, stand replacing (patchy)	309,981	20%
100-200 years, stand replacing	234,591	15%
200+ years, stand replacement	45,622	3%
<b>Total</b>	<b>1,557,654</b>	

### 4.3.3 Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy *et al.* (2001) and Schmidt *et al.* (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);

IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.

As scale of application becomes finer these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy *et al.* (2001) and Schmidt *et al.* (2001) (FRCC). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy *et al.* 2001, Schmidt *et al.* 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), “high graded” forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire. Determination of the amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the fire regime condition class. A simplified description of the fire regime condition classes and associated potential risks are presented in Table 4.17. A map depicting Fire Regime and Condition Class is presented in Appendix I.

**Table 4.17. Fire Regime Condition Class Definitions.**

Fire Regime		
Condition Class	Description	Potential Risks
<b>Condition Class 1</b>	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics.  Composition and structure of vegetation and fuels are similar to the natural (historical) regime.  Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.

**Table 4.17. Fire Regime Condition Class Definitions.**

<b>Fire Regime Condition Class</b>	<b>Description</b>	<b>Potential Risks</b>
<b>Condition Class 2</b>	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	<p>Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe).</p> <p>Composition and structure of vegetation and fuel are moderately altered.</p> <p>Uncharacteristic conditions range from low to moderate.</p> <p>Risk of loss of key ecosystem components is moderate.</p>
<b>Condition Class 3</b>	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	<p>Fire behavior, effects, and other associated disturbances are highly departed (more or less severe).</p> <p>Composition and structure of vegetation and fuel are highly altered.</p> <p>Uncharacteristic conditions range from moderate to high.</p> <p>Risk of loss of key ecosystem components is high.</p>

An analysis of Fire Regime Condition Class in Okanogan County shows that approximately 34% of the County is in Condition Class 1 (low departure), just about 16% is in Condition Class 2 (moderate departure), with 19% of the area in Condition Class 3 (Table 4.18).

**Table 4.18. Assessment of Current Condition Class in Okanogan County.**

	<b>Condition Class</b>	<b>Acres</b>	<b>Percent of Area</b>
1	Condition Class 1	1,167,096	34.3%
2	Condition Class 2	557,482	16.4%
3	Condition Class 3	628,165	18.5%
5	Agriculture	838,337	24.6%
6	Urban/Development/Ag	203,831	6.0%
7	Water	6,340	0.2%
	<b>Total</b>	<b>3,401,252</b>	<b>100.0%</b>

## **4.4 Okanogan County Conditions**

The productive soils of the bottomlands in Okanogan County make the river valleys well suited to growth of both grassland vegetation and agriculture. Over the course of the past century, much of the native riparian vegetation has been converted to agriculture fields supporting livestock grazing and agricultural crops such as fruit orchards.

Coniferous woodlands associated with the national forests cover the mountainous regions of the County. The transition zone between forest and grassland vegetation consists of a complex interfingering dependent on localized topographic and climatic conditions. A ponderosa pine and Douglas-fir habitat type typically forms the lower timberline on hills and low mountains. Mixed Douglas-fir, lodgepole pine, western red cedar, and western larch forests dominate at mid-elevations elevations, while subalpine fir, lodgepole, and Engelmann spruce occur at the higher elevations.

Okanogan County is characterized by cold winters and warm, dry summers. Fires in the forest fuel types present throughout the Okanogan Highlands have the potential to produce frequent,

large, intense fires, resulting in high social and economic costs. This potential has been realized several times over in the last century. Just within the last 25 years Okanogan County residents have seen at least three large and damaging wildfires including the 1985 Barker Mountain, which burned 60,000 acres, the 2001 Rex Creek/Virginia Lake Complex, which burned 130,000 acres in Okanogan and Ferry Counties (10 homes lost), and the 2001 Thirtymile Fire, which burned 9,300 acres and resulted in the death of four firefighters. These events clearly illustrate the mounting urban-interface issue facing Okanogan County. Population growth rates have been steadily increasing throughout the County. The growing appreciation for seclusion has led to significant development in the lower elevation forests and, particularly in the Methow Valley. Frequently, this development is in the dry ponderosa pine – Douglas-fir forest types where grass, needle, and brush surface litter create forest fuel conditions that are at a high propensity for fire occurrence. Human use is strongly correlated with fire frequency, with increasing numbers of fires as use increases. Discarded cigarettes, tire fires, and hot catalytic converters increase the potential for fire starts along roadways. Careless and unsupervised use of fireworks also contributes to unwanted and unexpected wildland fires. Further contributing to ignition sources are the debris burners and “sport burners” who use fire to rid ditches of weeds and other burnable materials. The increased potential for fire starts and the fire prone landscapes in which homes have been constructed greatly increases the potential for fires in interface areas.

#### ***4.5 Okanogan County’s Wildland-Urban Interface***

The Wildland-Urban Interface has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region. For Okanogan County, the WUI shows the relative concentrations of structures scattered across the County.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where forest fuels meet urban fuels in the case of wildfires (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes that lead directly to a risk to urban developments be it from wildfire, landslides, or floods. Reducing the hazard in the wildland urban interface requires the efforts of federal, state, and local agencies and private individuals (Norton 2002). “The role of [most] federal agencies in the wildland-urban interface includes wildland firefighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of Tribal, state, and local governments” (USFS 2001). Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures (USFS 2001). With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing defensible space, landowners would protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- minimizing the potential of high-severity ground or crown fires entering or leaving the area;

- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior (McCoy *et al.* 2001);
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three wildland-urban interface conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres;
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size; and

In addition to these classifications detailed in the Federal Register, three additional classifications of population density have been included to augment these categories:

- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries: it is set by very high population densities (more than 7-10 structures per acre or more). Many counties and reservations in the west do not have high density urban areas. Okanogan County, Washington, was determined not to have any areas of high density urban based on current (2006) structure locations.
- **Infrastructure Area WUI** – those locations where critical and identified infrastructure are located outside of populated regions and may include high tension power line corridors, critical escape or primary access corridors, municipal watersheds, areas immediately adjacent to facilities in the wildland such as radio repeater towers or fire lookouts. These are identified by County or reservation level planning committees.

The Okanogan County planning committee created one Infrastructure WUI sub-category, a Primary Access Route WUI, to better suit the wildfire mitigation needs of the County.

- **Access Route WUI** – a situation where primary access routes travel through designated Non-WUI areas (lands outside of the four main WUI conditions). This WUI includes a one mile buffer extending from each side of State Highway 20

along the stretch known as the North Cascades Highway in northwestern Okanogan County. There are approximately 13.3 miles of access routes totaling 8,504 acres of potential treatment areas which would otherwise have been designated as Non - WUI.

- **Non-WUI Condition** - a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure crossing these unpopulated regions. This classification is not WUI.

In summary, the designations of areas by the Okanogan County planning committee includes:

- Interface Condition: WUI
- Intermix Condition: WUI
- Occluded Condition: Not Present
- Rural Condition: WUI
- Infrastructure Areas: WUI
- High Density Urban Areas: WUI
- Non-WUI Condition: Not WUI, but present in Okanogan County

The locations of structures in Okanogan County have been mapped and are presented on a variety of map products in this analysis document; specifically in Appendix I. The location of all structures was determined by examining two sets of remotely sensed images. The more detailed information was garnered from digital ortho-photos at a resolution of 1 meter (from 1998). For those areas not covered by the 1 meter DOQQ images (primarily National Forest lands), black and white ortho-photos were used. These records were augmented with structure data provided by the Okanogan County GIS department.

All structures are represented by a “dot” on the map. No differentiation is made between a garage and a home, or a business and a storage building. The density of structures and their specific locations in this management area are critical in defining where the potential exists for casualty loss in the event of a disaster in the region.

By evaluating this structure density, WUI areas can be defined on maps by using mathematical formulae and population density indexes to define the WUI based on where structures are located. The resulting population density indexes create concentric circles showing high density areas of Interface and Intermix Condition WUI, as well as Rural Condition WUI (as defined above). This portion of the analysis allows us to “see” where the highest concentrations of structures are located in reference to high risk landscapes, limiting infrastructure, and other points of concern.

The WUI, as defined here, is unbiased, consistent, allows for edge matching with other counties and the Reservations, and most important – it addresses all of the County, not just identified communities. It is a planning tool showing where homes and businesses are located and the density of those structures leading to identified WUI categories. It can be determined again in the future, using the same criteria, to show how the WUI has changed in response to increasing population densities. It uses a repeatable and reliable analysis process that is unbiased. This mapping procedure was followed and is presented in the maps included in Appendix I.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the County or Reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the Federal Agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Okanogan County



Community Wildfire Protection Plan planning committee evaluated a variety of different approaches to determining the WUI for the County and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the Federal Agencies, it is hoped that it will serve as a planning tool for the County and local fire districts.

A map of the Wildland Urban Interface in Okanogan County as defined by the Community Wildfire Protection planning committee is included in Appendix I.

#### **4.5.1 Potential WUI Treatments**

The definition and mapping of the WUI is the creation of a planning tool to identify where structures, people, and infrastructure are located in reference to each other. This analysis tool does not include a component of fuels risk. There are a number of reasons to map and analyze these two components separately (population density vs. fire risk analysis). The primary among these reasons is the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependant on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest health issues or other concerns.

By examining these two tools separately the planner is able to evaluate these layers of information to see where the combination of population density overlays on top of areas of high current fire risk and then take mitigative actions to reduce the fuels, improve readiness, directly address factors of structure ignitability, improve initial attack success, mitigate resistance to control factors, or (more often) a combination of many approaches.

It should not be assumed that just because an area is identified as WUI, that it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site specific factors.

It should also not be assumed that WUI designation on national forest lands automatically equates to a treatment area. The Forest Service is still obligated to manage according to the Standards and Guides listed in their Forest Plans. The Forest Plan has legal precedence over the WUI designation until such a time that the Forest Plan is revised to reflect updated priorities.

Most treatments may begin with the home evaluation, and the implicit factors of structural ignitability (roofing, siding, deck materials), and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands (mapped as yellow) may look closely at access (two ways in and out) and communications through means other than land based telephones. On the other hand, the subdivision with densely packed homes (mapped as brown – interface areas) surrounded by forests and dense underbrush, may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

#### **4.6 Okanogan County Communities At Risk**

Individual community assessments have been completed for all of the populated places in the County. The following summaries include these descriptions and observations. Local place names identified during this plan's development include:

**Table 4.19. Okanogan County Communities.**

<b>Community Name</b>	<b>Planning Description</b>	<b>Vegetative Community</b>	<b>National Register Community At Risk?<sup>1</sup></b>
Molson	Community	Rangeland	No
Chesaw	Community	Forestland/Rangeland	Yes
Oroville	City	Rangeland	Yes
Loomis	Community	Forestland/Rangeland	Yes
Tonasket	City	Rangeland	Yes
Ellisforde	Community	Rangeland	No
Crumbacher	Community	Forestland/Rangeland	No
Havillah	Community	Forestland/Rangeland	No
Conconully	Town	Forestland/Rangeland	Yes
Wauconda	Community	Forestland/Rangeland	Yes
Coulee Dam	Town	Rangeland	No
Colville Agency	Community	Rangeland	No
Riverside	Town	Rangeland	Yes
Omak	City	Rangeland	Yes
Okanogan	City	Rangeland	Yes
Malott	Community	Rangeland	Yes
Brewster	City	Rangeland	Yes
Pateros	City	Rangeland	Yes
Methow	Community	Rangeland	Yes
Carlton	Community	Rangeland	Yes
Twisp	Town	Forestland/Rangeland	Yes
Winthrop	Town	Forestland/Rangeland	Yes
Mazama	Community	Forestland/Rangeland	Yes
Monse	Community	Rangeland	No
Nespelem	Town	Rangeland	Yes
Elmer City	Town	Rangeland	No

<sup>1</sup>Those communities with a “Yes” in the National Register Community at Risk column are included in the Federal Register, Vol. 66, Number 160, Friday, August 17, 2001, as “Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfires”. All of these communities have been evaluated as part of this plan’s assessment.

Because the Wildland Urban Interface map for Okanogan County was based primarily on population density as described above, all of these communities and the populated areas surrounding them are within the Okanogan County Wildland Urban Interface.

## **4.7 Neighborhoods in Okanogan County**

In order to facilitate the mutual understanding of wildfire risks specific to commonly referred to areas in Okanogan County, the planning committee identified Okanogan County subregions on a map they felt not only had similar fuel conditions, but also would render similar initial attack techniques. These subregions are called neighborhoods. Typically, neighborhood boundaries lie along local fire district boundaries or known anchor points such as roads or ridgelines. All of the neighborhoods lie within or mostly within the Wildland Urban Interface identified by Okanogan County in this plan. Where the Wildland Urban Interface boundaries are primarily based on population density, the neighborhood boundaries are strategic boundaries for fire suppression.

For the individual community assessments, the County was broken down by these neighborhoods. Furthermore, drainages or place names within neighborhoods are identified in the assessments in order to present as much specific wildfire risk information as possible. A map of Okanogan County Neighborhoods is included in Appendix I.

#### **4.7.1 Vegetative Associations**

Vegetative structure and composition in Okanogan County is closely related to elevation, aspect, and precipitation. Relatively mild and dry environments characterize the undulating topography of the region which transitions from the Okanogan and Methow River valley's riparian plant communities to the forest ecosystems that characterize the majority of the land area in Okanogan County. These forest communities contain high fuel accumulations that have the potential to burn at moderate to high intensities. Highly variable topography coupled with dry, windy weather conditions typical of the region is likely to create extreme fire behavior.

The transition between developed agricultural land and timberlands occurs somewhat gradually, usually within draws and along ridgetops. At higher elevation mountainous regions, moisture becomes less limiting due to a combination of higher precipitation and reduced solar radiation. Vegetative patterns shift from forested communities dominated by ponderosa pine and Douglas-fir at the lower elevations to lodgepole pine and subalpine fir at the higher elevations. Engelmann spruce and western red cedar are commonly found in moist draws and frost pockets. These forested conditions possess a greater quantity of both dead and down fuels as well as live fuels. Rates of fire spread tend to be lower than those in the grasslands; however, intensities can escalate dramatically, especially under the effect of slope and wind. These conditions can lead to control problems and potentially threaten lives, structures and other valued resources.

As elevation and aspect increase available moisture, forest composition transitions to moister habitat types. Increases in moisture keep forest fuels unavailable to burn for longer periods during the summer. This increases the time between fire events, resulting in varying degrees of fuel accumulation. When these fuels do become available to burn, they typically burn in a mosaic pattern at mid elevations, where accumulations of forest fuels result in either single or group tree torching, and in some instances, short crown fire runs. At the highest elevations, fire events are typically stand replacing, as years of accumulation fuel large, intense wildfires.

Insects and disease can cause widespread mortality of forest stands in a very short amount of time. Pine bark beetle populations have continued to increase at epidemic levels throughout Washington State; however, mortality increases are most pronounced in Eastern Washington. Ponderosa pine and lodgepole pine seem to be the most affected species at all elevations in Okanogan County. The occurrence of Ips beetles, Douglas-fir Beetle, Douglas-fir Tussock Moth, and root disease have also been recorded in Eastern Washington (Washington State Department of Natural Resources 2006). Insects and disease often focus and cause the most mortality in forest stands that are overcrowded or otherwise stressed by drought, recent fires, or other factors. Large areas of dead trees are a significant fire hazard. Oftentimes, dry, dead needles hang on the killed trees for several years making them prime for a potential ignition and subsequent crown fire. Thinning overcrowded stands can help reduce stress on individual trees allowing them to better withstand insect attacks. Planting of appropriate species for the site and continual management can also help ward off future outbreaks.

Many lower elevation forested areas throughout Okanogan County are highly valued for their scenic qualities as well as for their proximity to travel corridors. These attributes have led to increased recreational home development and residential home construction in and around forest fuel complexes. The juxtaposition of highly flammable forest types and rapid home

development will continue to challenge the ability to manage wildland fires in the wildland-urban interface.

#### **4.7.2 Overall Fuels Assessment**

The wide valley bottoms and availability of irrigation water throughout much of Okanogan County allows for extensive agricultural operations, particularly fruit orchards. Agricultural fields and orchards infrequently serve to fuel a fire. Most of the orchards within the valleys are irrigated until late in the fire season, which drastically reduces their likeliness of an ignition. Other agricultural products such as hay tend to burn in much the same manners a low growing grasses. Fires in grass and rangeland fuel types tend to burn at relatively low intensities, with moderate flame lengths and only short-range spotting. Suppression resources are generally quite effective in such fuels. Homes and other improvements can be easily protected from the direct flame contact and radiant heat through adoption of precautionary measures around the structure. Although fires in these fuels may not present the same control problems as those associated with large, high intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not taken place prior to a fire event. Wind driven fires in short grass fuel types spread rapidly and can be difficult to control. During extreme drought and pushed by high winds, fires in grassland fuel types can exhibit extreme rates of spread, thwarting suppression efforts.

The Okanogan Highlands are a patch-work of dry Douglas-fir and ponderosa pine forests that, in many areas, have become overstocked, resulting in multistoried conditions with abundant ladder fuels. During pre-settlement times, much of this area was characterized by low intensity fires due to the relatively light fuel loading, which mostly consisted of small diameter fuels. Frequent, low intensity fires generally kept stands open; free of fire intolerant species and maintained seral species such as ponderosa pine as well as larger diameter fire resistant Douglas-fir. In some areas, low intensity fires stimulated shrubs and grasses, maintaining vigorous browse and forage. The shrub layer could either inhibit or contribute to potential fire behavior, depending on weather and live fuel moisture conditions at the time of the burn.

In general, large fires that start in the Okanogan Highlands start high in elevation and move downhill. As fires move down in elevation, they encounter drier and flashier fuels in the lower elevations. Rolling embers and spot fires are a common method of downhill fire spread. Spot fires ignited on slopes trigger uphill runs that throw more spot fires, expanding the downward fire progression. Modifying fuels to reduce the likelihood of torching and crowning trees will in turn reduce the likelihood of spot fires.

Increased activities by pathogens will continue to increase levels of dead and down fuel, as host trees succumb to insect attack and stand level mortality increases. Overstocked, multi-layered stands and the abundance of ladder fuels lead to horizontal and vertical fuel continuity. These conditions, combined with an arid and often windy environment, can encourage the development of a stand replacing fire. These fires can burn with very high intensities and generate large flame lengths and fire brands that can be lofted long distances. Such fires present significant control problems for suppression resources, often developing into large, destructive wildland fires.

A probability that needs to be planned for is the likelihood of extended spot fires. Large fires may easily produce spot fires from ½ to 2 miles away from the main fire. How fire suppression forces respond to spot fires is largely dependent upon the fuels in which they ignite. Stands of timber that are managed for fire resilience are much less likely to sustain torching and crowning behavior that produces more spot fires. The objective of fuel reduction thinning is to change the

fuels in a way that will moderate potential fire behavior. If fire intensity can be moderated by vegetation treatments, then ground and air firefighting resources can be much more effective.

Areas that have recently burned, such as the Tripod Fire, will be at low risk of wildfires starting and spreading for several years because fine fuels were consumed. However, the overall reduction in hazardous fuels in these areas is minimal, particularly in dry Douglas-fir and ponderosa pine forests which were dense, multi-storied stands prior to wildfire. Dense stands of snags will become heavy dead and down branches and logs within 10-20 years. Fine fuels will return to these sites as understory species re-establish and these fuels combined with the accumulated large fuels will provide the opportunity for severe fire in 20-30 years after the initial wildfire. Examples of these types of fires include the Deer Point Fire in 2002 and the Pot Peak Fire in 2004.

### **4.7.3 Overall Mitigation Activities**

There are many specific actions that will help improve the safety in a particular area; however, there are also many potential mitigation activities that apply to all residents and all fuel types. General mitigation activities that apply to all of Okanogan County are discussed below while area specific mitigation activities are discussed within the individual community assessments.

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective. Prevention campaigns can take many forms. Traditional “Smokey Bear” type campaigns that spread the message passively through signage can be quite effective. Signs that remind folks of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires can be quite effective.

Active prevention techniques involve mass media, radio, or the local newspapers. Fire districts in other counties have contributed to the reduction in human-caused ignitions by running a weekly “run blotter,” similar to a police blotter, each week in the paper. The blotter briefly describes the runs of the week and is followed by a “tip of the week” to reduce the threat from wildland and structure fires. The federal government as well as the Washington Department of Natural Resources has been a champion of prevention, and could provide ideas for such tips. When fire conditions are high, brief public service messages could warn of the hazards of misuse of fire or any other ignition sources.

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Okanogan County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Okanogan County should be encouraged to work with local fire departments and fire management agencies within the County to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community. The survey of the public conducted during the preparation of this Community Wildfire Protection Plan indicated that approximately 48% of the respondents are interested in participating in wildfire education programs.

Development of community evacuation plans is necessary to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce

chaos and escape times for fleeing residents. Community safety zones should also be established in the event of compromised evacuations. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Also of vital importance is the accessibility of the homes to emergency apparatus. The fate of the home often will largely be determined by homeowner actions prior to the event. Homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles.

Recreational facilities near communities, along the Okanogan River, Methow River, Columbia River, Pearrygin Lake, Alta Lake, Bonaparte Lake, Lost Lake, Osoyoos Lake, and others, or in the surrounding forest and rangelands should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting pre-commercial thinning, pruning and limbing, and possibly controlled burns.

Other actions to reduce fire hazards are thinning and pruning timbered areas, creating a fire resistant buffer along roads and power line corridors, and strictly enforcing fire-use regulations. High tension power lines coming from Ferry County or originating directly from Grand Coulee or Chief Joseph Dam are the only sources of electrical power to Okanogan County; thus, protecting these corridors is a high priority. Ensuring that the area beneath the lines has been cleared of potential high risk fuels and making sure that the buffer between the surrounding forest lands is wide enough to adequately protect the poles as well as the lines is imperative.

Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

In order to assure a quick and efficient response to an event, emergency responders need to know specifically where emergency services are needed. Continued improvement and updating of the rural addressing system is necessary to maximize the effectiveness of a response.

Other specific mitigation activities are likely to include improvement of emergency water supplies and management of trees and vegetation along roads and power line right-of-ways. Furthermore, building codes should be revised to provide for more fire conscious construction techniques such as using fire resistant siding, roofing, and decking.

## **4.7.4 Okanogan River Valley**

### **4.7.4.1 Neighborhoods of Oroville, Tonasket, Crumbacher, Omak-Okanogan, Malott, and Brewster**

The neighborhoods of Oroville, Tonasket, Crumbacher, Omak-Okanogan, Malott, and Brewster all lay within the immediate Okanogan River Valley floor and foothills. These neighborhoods are the most heavily developed in eastern Okanogan County. For the most part, all of these neighborhoods have been largely developed for commercial, residential, and agricultural

purposes with population clusters occurring around the incorporated communities of Oroville, Tonasket, Riverside, Omak, Okanogan, Brewster, and Pateros and the unincorporated communities of Monse, Malott, Crumbacher, and Ellisforde. Due to the obliging climate and availability of water throughout the valley, various types of orchards are grown extensively.

The Oroville Neighborhood is the northernmost and encompasses the community of Oroville, structures surrounding Osoyoos Lake, and the valley bottom stretching south approximately two miles past Swanson Mill Road. The Tonasket Neighborhood meets the southern border of the Oroville Neighborhood and follows the valley bottom south almost to Crumbacher Road. This neighborhood includes the communities of Tonasket and Ellisforde. The Crumbacher Neighborhood is one of the smallest in the County and includes the portion of the Okanogan River Valley surrounding the community of Crumbacher. The Omak-Okanogan Neighborhood extends from the south edge of the Crumbacher Neighborhood, encompasses the communities of Riverside, Omak, and Okanogan, and ends approximately three miles south of Okanogan. The Malott Neighborhood is relatively small and surrounds the community of Malott including the valley floor and a small portion of the nearby foothills. Much of the residential development in the Malott area occurs along the Okanogan River and Highway 97 corridor. The neighborhood of Brewster covers a large area on the south end of the County with the Columbia River defining much of its southern boundary. This neighborhood includes the communities of Monse, Brewster, and Pateros.

#### **4.7.4.1.1 Fuels Assessment**

Most of the neighborhoods in the Okanogan River Valley are heavily developed for residential, commercial, or agricultural use. Orchards, livestock pasture, hay, or other crops are grown on nearly every available acre that has access to irrigation water. During the summer and fall, this creates a mosaic of lush green vegetation where there is irrigation and cured sage and grass in areas where there isn't.

Wildland fuels within the valley floor of the Oroville Neighborhood are minimal due to extensive commercial and residential development as well as the proliferation of the orchards and other crops. The foothills rising out of the valley are typically covered by sage brush and bunchgrasses that form a continuous fuel bed. The steepness of the topography is variable; however, the foothills near the valley have low to moderate steepness, but the degree of slope tends to increase on the mid and upper slopes. The slope rising from the east side of the valley between the community of Oroville and Swanson Mill Road is much steeper and sparsely forested by ponderosa pine. This slope is characterized by shear rock faces and outcroppings; however, the lack of vegetation does not generally help to slow the upslope spread of wildfire.

Around the communities of Tonasket and Ellisforde in the Tonasket Neighborhood, wildland fuels are limited to ditches or small bare lots due to the existence of numerous structures and agricultural development. The foothills and some non-irrigated areas along Highway 97 tend to be vegetated by sagebrush and lower growing grasses, particularly bunchgrasses. These fuels form a continuous fuel bed with similar fuels on the mid and upper slopes surrounding the valley.

The Crumbacher Neighborhood is made up of fuels consisting of sagebrush and grasses both within the valley and in the surrounding foothills. An open stand of ponderosa pine with a grassy understory surrounds and intermixes with the small population cluster known as the Crumbacher community.

Wildland fuels within the communities of Riverside, Omak, and Okanogan in the Omak-Okanogan Neighborhood are fairly limited to ditches, empty lots, and the riverbanks due to

extensive urban and agricultural development. Orchards and other crops grow both within the valley and on many of the low benches where irrigation water is available. The surrounding foothills are vegetated primarily by sagebrush and various lower growing grasses. Sparse ponderosa pine can be found in a few of the nearby draws. The slope rising from the east side of the river near Omak is steep, almost vertical in some places; however, it appears to be nearly solid rock with little soil available for plant growth.

On the west side of the river, the Malott Neighborhood has been extensively developed for agricultural purposes. The gently topography with low, flat benches is conducive to the production of large orchards and other crops. Wildland fuels in this area are generally limited to ditches, vacant lots, and in the non-irrigated portions of the foothills. The east side of the valley is not as developed and, therefore, is covered by sagebrush and grass vegetation. The slope rising from the Highway towards Soap Lake Mountain is moderately steep with few dissections.

The production of fruit orchards and a few other crops along both the Okanogan River and the Columbia River is very prolific in the Brewster Neighborhood. Wildland fuels near the population centers tend to be limited; however, they become more intermixed with structures and agriculture as the distance from these rivers increases. Structures to the north of the Brewster community along Valley Road, North Star Road, and in the Harmony Heights area are typically abutted by wildland fuels consisting of sagebrush and grass. The topography in this area tends to gently roll away from the rivers; however, the Whitestone Creek drainage and the Indian Dan Canyon exhibit some steeper topography. The slope on the east side of Harmony Heights into Whitestone Creek is a nearly vertical rock face rising from about 1,300 feet to almost 3,000 feet.

#### **4.7.4.1.2 Ingress-Egress**

The main arterial through these neighborhoods and all of the Okanogan River Valley is U.S. Highway 97 from the Okanogan – Chelan County border all the way to Canadian border. These neighborhoods contain many of the populated communities in the County; therefore, there is a multitude of County and city roads. State Routes 20, 215, 17, 153, 173, and 155 also cross through the Okanogan River Valley.

#### **4.7.4.1.3 Infrastructure**

All of the residents within the city limits of Oroville, Tonasket, Riverside, Omak, Okanogan, Brewster, and Pateros have access to the municipal water systems. Those outside the city limits and in unincorporated communities typically rely on personal or multiple home well systems.

The bench west and north of Omak and Okanogan is served by the Okanogan Irrigation District. This is a pressurized system with two reservoirs; Lower Conconully Lake and Upper Conconully Lake. The water is released through a dam on the lower lake into Salmon Creek and then diverted from Salmon Creek about 3 miles upstream from its mouth at the Okanogan River. This water enters a concrete lined canal that takes it north and east across the Okanogan and Omak Flat where there are pumping stations. During periods of drought they can supplement this system by pumping from the Okanogan River. They also receive some water from Johnson Creek, which is diverted by pipe to Duck Lake on the North Omak Flat. There is also a small private water right (Swayze) that exists on Salmon Creek that covers several residences and small farms just west of the Okanogan city limits. This system also diverts water from Salmon Creek.



The Alta Vista Irrigation District is a small irrigation district within the boundaries of the City of Okanogan. This system draws its water from the Okanogan River and is dispersed into the neighborhood by buried pipe covering five blocks north of Pines Street to Irene Street west of the Okanogan River.

Tonasket, Oroville and Ellisforde are served by the Oroville-Tonasket Irrigation District.

There are two electrical substations in close proximity to the City of Okanogan. They are both located on Van Duyn Street from which they distribute the power to various parts of the County. A transmission line to the upper Methow follows the same general route as State Route 20. This line terminates at a substation at the Town of Twisp. There is also a transmission line that goes south to the Brewster area following State Route 97 for 13 miles and then crosses the Okanogan River and ends in Brewster Flat. Grand Coulee Dam generates power, which is then distributed by high tension lines across the Colville Indian Reservation to the substations in Okanogan and to a substation located near Coleman Butte. This transmission line continues north to the City of Tonasket generally following the State Route 97 corridor.

#### **4.7.4.1.4 Fire Protection**

The Okanogan Fire Protection District #1 provides both structural and wildfire protection for nearly all of the Oroville Neighborhood. Okanogan County Fire Protection District #4 covers much of the Tonasket Neighborhood including the communities of Ellisforde, Tonasket, Crumbacher, and a narrow corridor east along State Route 20 to the Aeneas Valley Road. Okanogan County Fire Protection District #7 provides protection for an area extending from the community of Riverside and including a small part of Omak suburbs. Fire District #7 encompasses part of the Crumbacher and Omak-Okanogan Neighborhood. Okanogan County Fire Protection District #3 covers a large part of the Okanogan River Valley including the majority of the Omak – Okanogan and Malott Neighborhoods. Finally, Okanogan County Fire Protection District #15 provides structural and wildland fire protection for the Brewster Neighborhood, which includes the communities of Pateros, Brewster, and Bridgeport Bar.

All of the Okanogan County fire districts have signed a “Memorandum of Understanding” to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S.

Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.1.5 Community Assessment**

The Oroville, Tonasket, Crumbacher, Omak-Okanogan, Malott, and Brewster Neighborhoods all have similar fire risks. Being in the Okanogan River Valley allows for irrigation of landscaping and agricultural crops, which not only helps keep the vegetation green and at lower propensity for ignitions, but also gives firefighters abundant access to water resources for suppression purposes. As crop production slows in the fall, the irrigation pressure tends to taper off, leaving previously lush grasses and other vegetation to dry out and become a potential fire hazard.

The sagebrush and grassland fuels that dominant this part of the County usually becomes available to burn fairly early in the summer. The growth of a productive orchard takes many years and is, therefore, a long term investment. The potential loss of these orchards and the surrounding structures to fire would severely damage the local economy as well as change the way of life for many residents.

The intense human activity throughout the entire valley significantly increases the potential for an accidental ignition. Debris or slash fires, sparks from vehicles, and fireworks are just a few of the many possible ignition sources. Highly used recreational areas such as around Osoyoos Lake in the Oroville Neighborhood have an increased fire risk due to the increased ignition sources associated with campfires, BBQ pits, ATV or watercraft motors, cigarettes, and other human activities. Natural ignitions from lightning are also very common as summer thunderstorms pass through the area. In the event of a large wildfire in the area, smoke may tend to settle in the valley causing detrimental health affects to at-risk residents.

Most of the homeowners in these neighborhoods have created some kind of defensible space area around their structures to lessen the fire risk; however, there are some sites, particularly in the foothills areas, with wildland fuels abutting their homes that may have an increased risk of fire. Access to private homes and other structures outside of the urban areas is not typically limited by the road system; however, house numbers are sometimes difficult to see or nonexistent both on homes and at the end of private drives, which can make locating specific addresses difficult in any emergency situation. In addition, some bridges in the area were not built to sustain the weight of large fire apparatus. Educating residents on the importance of home defensibility and fire safety will help reduce the fire risk in these communities.

#### **4.7.4.1.6 Mitigation Activities**

Most of the area within the Oroville, Tonasket, Crumbacher, Omak-Okanogan, Malott, and Brewster Neighborhoods has a moderate to high risk of experiencing a wildfire. Defensible space practices and fire resistant landscaping techniques around homes, particularly those surrounded by wildland fuels, will help protect structures and families once a fire has started. The best possible defense prior to an ignition is public education. Accidental ignitions by humans in the Okanogan River Valley occur relatively frequently and pose a significant risk of spread. Education campaigns designed to bring attention to this hazard and its potential effects can help reduce the number of ignitions. Local fire officials should take a particularly aggressive approach to public education around intensely used recreational areas such as around Osoyoos Lake or campgrounds along the Okanogan or Columbia Rivers. The Okanogan County building permit process should include an information assessment of the proposed site to tell a prospective home builder/buyer whether or not they are inside a fire protection district. The use

of escape proof fire rings and BBQ pits at recreational facilities and strict firework and fire use policies will help reduce the potential wildfire risk within the valley.

#### **4.7.4.2 Neighborhoods of Similkameen, Loomis, Palmer, and Wannacut**

Similkameen, Loomis, Palmer, and Wannacut are the northernmost neighborhoods on the west side of the Okanogan River Valley.

The Similkameen Neighborhood is defined by the Similkameen River. There are only a handful of residents within this drainage, most of which are larger farms and ranches occurring near the remnant community of Nighthawk.

The unincorporated community of Loomis is located within the Loomis Neighborhood. There is a cluster of homes and a few businesses within the Loomis town site; however, there are also many permanent, seasonal, and recreational structures around both Spectacle Lake and Whitestone Lake to the east. These lakes, particularly Spectacle Lake, are heavily used for recreational purposes including campgrounds, boat launches, and fishing access. There are also several structures stretching from Loomis south along Sinlahekin Creek up to the Sinlahekin Wildlife Area boundary.

The Palmer Neighborhood surrounds the Palmer Lake basin. The lake is bordered by steep slopes with most of the structures occurring along the eastern shore. Palmer Lake is one of the largest lakes within Okanogan County; fed by Sinlahekin Creek from the south and draining into the Similkameen River from its north end.

The Wannacut Neighborhood encompasses Wannacut Lake and much of the area informally known as Ellemeham. Most of the structures in this neighborhood are located near Wannacut Lake or along its access routes (Wannacut Lake Road and Blue Lake Road). This is an area of Okanogan County that is experiencing growth with the addition of new homes and cabins. Many of these new home builders may be unaware that their investments are outside of local fire protection boundaries. In addition to permanent residents, there are several recreational resorts as well as seasonal homes surrounding Wannacut Lake. There are also a few scattered structures to the north in Hicks Canyon and in the Ellemeham Mountain area.

##### **4.7.4.2.1 Fuels Assessment**

Fuels in the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods are primarily dependent on the topography. Sagebrush and grasses dominate the lower and mid slopes. This type of fuel tends to dry out early in the summer and support very rapidly spreading surface fires. The topography consists of moderate to steep slopes rising out of the drainages, which tends to encourage the quick spread of fires upslope.

Sparse stands of ponderosa pine and Douglas-fir can typically be found in some draws and along the upper slopes in these neighborhoods. This type of dry forestland fuels can also be found along the shores of Wannacut Lake and the surrounding hillsides. The steep slopes around Palmer Lake are also partially forested with sparse ponderosa pine and Douglas-fir. Fires in this type of fuel would be expected to move very quickly along the surface with occasional torching and crowning of the canopy. Fuel loading in stands that have not been burned or otherwise been managed for many years may burn more intensely and have a higher rate of tree mortality.

The landscape to the west of the Sinlahekin Valley towards the Okanogan National Forest boundary is very rugged and covered by forestland fuels. Fires in these mountains would likely burn very intensely and be difficult to suppress. Aggressive initial attack would likely be able to

keep fires in these forestlands from moving into populated areas due to the transition to sage and grassland vegetation on the lower slopes; however, this is not guaranteed and residents should be made aware of the potential risk.

#### **4.7.4.2.2 Ingress-Egress**

The primary ingress/egress route through all of these neighborhoods is the Loomis-Oroville Road, which travels in a big loop from Oroville through Nighthawk and Loomis and reconnects with Highway 97 near Ellisforde. This is a paved, two-lane highway throughout its extent. The Wannacut Lake area can be reached via the Wannacut Lake Road from the Loomis-Oroville Road near Spectacle Lake or by the Blue Lake Road, which comes in from the north. Both of the Wannacut Lake access routes are well maintained graveled roads. There are also several secondary roads that can be used to access different regions of the Similkameen, Loomis, Palmer, or Wannacut Neighborhoods. Specifically, the Ellemeham Mountain Road accesses several homes in the Ellemeham Mountain area as well as provides an additional access route into Wannacut Lake via Hicks Canyon. Sinlahekin Road travels from Loomis up Sinlahekin Creek to the south eventually ending at Conconully. Sinlahekin Road could also be used as a potential escape route, if necessary. Horse Spring Coulee Road is a well maintained gravel route making an additional southward connection between residents in the Loomis area and Tonasket. The Similkameen Road near Lenton Flat in the Similkameen Neighborhood is a short, paved route from the Loomis-Oroville Road to the Nighthawk Port of Entry into Canada.

The Similkameen, Loomis, and Wannacut Neighborhoods have a reasonable amount of alternative escape routes other than the Loomis-Oroville Road in the event of a fire-involved evacuation. Due to the steep topography; however, residents in the Palmer Neighborhood are limited to the main Loomis-Oroville Road as their sole escape route. Nevertheless, this route is likely to be the safest escape route from Palmer Lake either to the north or the south.

#### **4.7.4.2.3 Infrastructure**

Residents near the Loomis community center have access to a municipal water system, but all other residents in the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods rely on personal or multiple home well systems. Irrigation water is provided to the Loomis, Spectacle Lake, and Whitestone Lake areas by the Whitestone Irrigation District.

The main transmission line extends from Tonasket to Oroville where it is distributed to the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods through public distribution lines.

#### **4.7.4.2.4 Fire Protection**

Okanogan County Fire Protection District #10 provides structural and wildland fire protection to a small service area surrounding the community of Loomis and a narrow strip along the Loomis-Oroville Road to encompass most of the area immediately surrounding Spectacle Lake. Currently, the Fire District #10 does not have a structure to house any of their rolling stock; therefore, it is sitting, unprotected, in an empty field just outside of Loomis. Nearly all other structures in the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods are not currently covered by a rural fire district (there are a few structures in the Loomis Neighborhood that are within Okanogan County Fire Protection District #4).

All of the Okanogan County fire districts have signed a “Memorandum of Understanding” to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.2.5 Community Assessment**

The Neighborhoods of Loomis, Palmer, and Wannacut have a high potential fire risk due to the abundance of recreational activities. Many of the homes in these neighborhoods are only seasonally or occasionally lived in and; therefore, homeowners' may not be fully aware of the wildfire risk. Also, heavily used recreational areas such as Palmer Lake, Spectacle Lake, and Wannacut Lake have an increased potential for fire due to ignition sources associated with campfires, BBQ pits, ATV or watercraft motors, cigarettes, and other human activities.

The Similkameen Neighborhood has a moderate potential for a wildland urban interface fires due to the lower population density. The sage and grass fuels and the steep topography in this neighborhood will tend to support rapidly spreading wildfires leaving homeowner's little time to prepare in advance of a flame front. Most of the homes in this neighborhood have been built along the river corridor and are surrounded by irrigated agricultural land; however, education on how to properly create a defensible space should be made available. The Loomis-Oroville Road through this neighborhood is fairly defensible, particularly as it parallels the Similkameen River, and the bridge at Nighthawk is also well constructed and resistant to damage by fire. This neighborhood does not have any rural fire protection.

The Loomis Neighborhood has a high potential fire risk due to the abundance of recreational activity and increased residential development. The Gold Hill and Cecile Creek areas west of the Loomis townsite have experienced a significant increase in the number of both seasonal and permanent homes. Many of these new home builders in the Loomis area are unaware that their investments may be outside of local fire protection district boundaries. The fire risk in these areas is particularly high due to the steep topography, limited access, and forest fuels. The fuels bordering the Loomis-Oroville Road corridor and surrounding Spectacle and Whitestone Lake are very conducive to an ignition as well as rapid fire spread. Structures in this area should be protected from wildfires by creation of a defensible space involving green and clean lawns, fire resistant landscaping, and fire resistant siding, roofing, and decking.

Structures in the Palmer Neighborhood are located along the eastern shore at the base of a very steep slope. This neighborhood has a moderate wildland urban interface-type fire risk due

to the bulk of the population being located in one area at the base of the slope and the accessibility to water. Fires in this area are more likely to start near the lake and move upslope away from the population rather than back down the steep mountains to the community without initial attack interference. Nevertheless, many of the structures on Palmer Lake are recreational homes with out-of-area owners. Some homeowners in this area may not be fully aware of the potential fire risk; thus, their homes do not have an adequate defensible space. Also, homes in the Palmer Neighborhood are not covered by a rural fire protection district.

The Wannacut Neighborhood has a very high risk of experiencing a wildfire. This area is currently seeing an influx of residents and recreationers, particularly near Wannacut Lake. Intense construction as well as recreational activity and traffic combined with high risk fuels point towards a need for precautionary measures as well as an aggressive educational campaign. Many structures in this area were constructed using wood materials for siding, roofing, and/or decking. In addition, many structures are surrounded or abut higher risk wildland fuels. Homeowners should be made aware that these home site characteristics make their homes prone to damage by wildfire, particularly since there is currently no rural fire protection in this neighborhood.

Homes in all neighborhoods should be accessible to firefighting apparatus and have clearly identified addresses on homes and at the end of private driveways.

#### **4.7.4.2.6 Mitigation Activities**

The best defense for homeowners in the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods is the construction of a defensible space around homes. Homesites surrounded by fire resistant landscaping have a much better chance of surviving a flame front than those who do not. Several homes in these areas are reached by one-way in, one-way out roads; making it difficult for fire suppression vehicles to safely access the area. Providing pullouts and turnaround areas as well as reducing roadside fuels drastically improves the safety of both residents and firefighters. Additionally, efforts should be made to keep the Loomis-Oroville Road clear of fuels, which could include mowing or herbicide application, due to its being the primary ingress/egress route for all of these neighborhoods.

Education, particularly where there is an increased amount of recreational homes and activity should be a high priority. Awareness of the risk factors, potential ignition sources, and consequences can help avoid losses from wildfire as well as costly suppression. The Okanogan County building permit process should include an information assessment of all proposed building sites to tell a prospective home builder whether or not they are within an established fire protection district.

In developed recreational facilities, fires should be limited to escape proof fire rings and BBQ pits. Regulations concerning fireworks and fire use should be strictly followed and enforced throughout the County.

#### **4.7.4.3 Neighborhoods of Pine Creek, Happy Hill, Cook Mountain, and Conconully**

The Neighborhoods of Pine Creek, Happy Hill, Cook Mountain, and Conconully are centrally located within the Okanogan River Valley extending westward from the more heavily developed valley floor. Pine Creek, Happy Hill, and Cook Mountain Neighborhoods cover a large area and are characterized by widely scattered structures with population clusters in the areas of North Pine Creek, South Pine Creek, Limebelt, Salmon Creek, Chilliwist Valley, and along the State Route 20 corridor heading towards Loup Loup Summit.

The Conconully Neighborhood is located along the western edge of the Happy Hill Neighborhood and the southwestern edge of the Pine Creek Neighborhood. This neighborhood encompasses the incorporated town of Conconully and the Conconully State Park. Although there are many permanent residents, Conconully has been heavily developed as a recreationally destination. There are several resorts, campgrounds, and other recreational facilities surrounding the town site and the Conconully Reservoir and Conconully Lake. Most of the current development occurs within the town site, along the northern shore of Conconully Lake, and along the northwestern corner of Conconully Reservoir. In addition, there are numerous scattered residences along West Fork Road to the southwest and along Salmon Creek North Fork Road to the north.

#### **4.7.4.3.1 Fuels Assessment**

The Pine Creek Neighborhood is primarily covered by sagebrush and grasses. The Pine Creek area is sparsely populated; however, where homes occur, pasture ground or small crop fields have usually been established. Sparse stands of ponderosa pine can be found on a few of the mountain tops including Carter Mountain and Aeneas Mountain and scattered amongst some of the draws near the western border of the neighborhood. Fires in this type of fuel bed will tend to be very fast moving surface fires burning at a low to moderate intensity. Occasional torching of trees may occur where ladder fuels have built up at some of the higher elevations.

The Happy Hill Neighborhood is also primarily covered by sagebrush and grasses; however, there are scattered stands of ponderosa pine and Douglas-fir on the upper slopes in the Limebelt area and on the south side of Salmon Creek. Fuel loads further west of Salmon Creek drainage increase as the landscape transitions to more continuous forest stands extending into the Okanogan National Forest. Fires in the sagebrush and grassland fuels will tend to move very rapidly, but burn at moderate intensities. For the most part, fires in the lower density forest stands occurring in the Limebelt area and on the lower slopes of the Salmon Creek drainage will tend to stay along the surface with only occasional flare ups, jackpotting, or torching of individual trees. A fire moving west out of Salmon Creek may increase in intensity as more woody fuel is available along the forest floor.

The eastern half of the Cook Mountain Neighborhood is dominated by sagebrush and grass with only occasional occurrence of sparse ponderosa pine on the tops of Fox Mountain, Chilliwist Butte, Leader Mountain, and Reed Mountain. Fires in this area will tend to spread very quickly, particularly upslope, but generally burn at a low to moderate intensity. As you go further west, past the Chilliwist Valley and Leader Lake, the forest vegetation begins to become more continuous. Thus, the west half of the neighborhood consists of mostly continuous stands of Douglas-fir, ponderosa pine, and some western larch stretching westward into the Okanogan National Forest. Some forestland owners along State Route 20 and in the Chilliwist Valley have thinned trees and treated the slash around on their property, which lessens their fire risk significantly. Fires in this forest type will burn with variable intensities with occasional jackpotting, torching, and crowning.

The fuels in the Conconully Neighborhood are somewhat variable. Sparse to moderate density ponderosa pine and Douglas-fir stands are dominant around the shores of Conconully Lake, Conconully Reservoir, and extending to the west towards the Okanogan National Forest boundary. The understory vegetation is a mixture of open grass and shrub transitioning to mostly shrub and conifer regeneration as the elevation increases. Where homes occur some of the larger trees and understory vegetation in the immediate area has been thinned to allow for development. The south and west aspect slopes near the community are mostly covered with various grasses, a few sparse shrubs, and an occasional ponderosa pine. Due to the variable

topography and vegetation, fire behavior will also tend to be variable. Fires will typically burn more intensely where forest fuels are more dense such as in the Salmon Creek drainages. On grass slopes and in open, well spaced forest stands, fires will typically move quickly through the flashy surface fuels, but burn with less intensity. Many of the structures within the Conconully community were built using wood materials for siding, decking, and or roofing, which because of its ignitability, adds to the potential fuel load.

#### **4.7.4.3.2 Ingress-Egress**

The Pine Creek, Happy Hill, Cook Mountain, and Conconully Neighborhoods are relatively rural areas in Okanogan County; therefore, most of the main thoroughfares are graveled routes maintained by the County.

In the Pine Creek Neighborhood, Horse Spring Coulee Road is the primary access route on the north end and the Pine Creek Road, which makes a big loop, is the primary access on the south end. For the most part, these roads are well maintained, graveled routes with plenty of room for two vehicles to pass each other. The Pine Creek Road, which meets the Fish Lake Road, is paved from Highway 97 to Fish Lake. There are also several secondary roads, most of which are also graveled; however, some, such as Stadler Road and Hagood Road, are narrow and not well maintained.

The main access routes in the Happy Hill Neighborhood include Limebelt Road, Conconully Road, and the Salmon Creek Road. The Conconully Road is paved between Highway 97 and the town of Conconully; however, most of the other County roads in this neighborhood are well maintained, graveled routes. There are also numerous secondary roads throughout this area that are also typically graveled. Access into the Limebelt area is very limited due to numerous dead end roads and driveways. The main ingress/egress route, Limebelt Road (from Conconully Road), is well maintained for several miles, but begins to deteriorate and eventually dead ends near Sutton Lake about two miles short of connecting to Pine Creek Road. There are several secondary roads in the Limebelt area; however, they typically provide only one-way in and one-way out and are not regularly maintained.

The Cook Mountain Neighborhood contains a segment of State Route 20, a paved, two lane highway connecting Okanogan to Twisp via Loup Loup Summit. The only other main access route in this area is the Chilliwist Road, which provides access to residents in the Chilliwist Valley. The Chilliwist Road is a well maintained gravel route until it reaches the upper extent of the valley, at which point it becomes a narrow, one-way dirt road. There are also numerous one-way in, one-way out private driveways off the Chilliwist Road. The North Cook Mountain Road provides a good alternative escape route between the Chilliwist Valley and State Route 20 near the Summit; however, one of the landowners in this area has prohibited this emergency access by gating it off. In a fire emergency, the Sullivan Creek Road just west of the North Cook Mountain Road would serve the same purpose, but this is a slightly longer and less maintained dirt road.

The primary access into the Conconully Neighborhood is provided by the Conconully Road. This is a paved, two lane route between Omak and Conconully. The Sinlahekin Road and the West Fork Road also provide graveled access to the town site from the north and south, respectively. There are a minimal number of secondary roads in this neighborhood, but those that exist are typically gravel or dirt routes traveling through the forested areas to the north and west of the community.



#### **4.7.4.3.3 Infrastructure**

Residents in the town of Conconully have access to the municipal water system, but all other residents of the rural neighborhoods of Pine Creek, Happy Hill, Cook Mountain, and Conconully rely on personal or multiple home well systems.

The neighborhoods of Pine Creek, Happy Hill, and Cook Mountain are provided electrical power via public distribution lines stemming from the main transmission lines in the Okanogan River valley. A branch of one of the main transmission lines travels from the valley up Conconully Road to the Town of Conconully.

#### **4.7.4.3.4 Fire Protection**

Much of the Happy Hill and Conconully Neighborhoods have structural and wildland fire protection provided by Okanogan County Fire Protection District #9, excluding the north end of the Limebelt area. Additionally, the Town of Conconully maintains its own Volunteer Fire Department with fire protection responsibility within the community. Okanogan County Fire Protection District #3 extends part way up State Route 20 and the Chilliwist Road to provide structural and wildland fire protection to residents in those areas. Residents in the Pine Creek area lack any fire protection from a rural district.

All of the Okanogan County fire districts have signed a “Memorandum of Understanding” to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.3.5 Community Assessment**

The Pine Creek and Happy Hill Neighborhoods have a moderate risk to wildland fire. Residents in these areas typically live on large lots, farms, or ranches surrounded by grass and sagebrush fuels. Homeowner’s should be made aware of the potential for a wildfire to move very quickly through these flashy fuels giving them little time for evacuation. In general, maintaining a clean and green lawn around structures will help reduce their risk of loss to fire.

Residents in the Cook Mountain Neighborhood have a moderate to high potential fire risk due to the increase in forestland fuels and the concentration of structures and human activity along State Route 20 and in the Chilliwist Valley. All residents should be aware of the fire risk associated with living in this fuel type. A clean defensible space around home sites and strict restrictions on debris and slash burning should be enforced. Many homes in the upper extent of the Chilliwist Valley and along State Route 20 are accessed by narrow private driveways. In several cases, these drives abut higher risk fuels and cannot be safely accessed with fire suppression apparatus.

Residents in the Conconully Neighborhood have a very high risk of experiencing wildfire as was seen during the 2006 Tripod Fire. Not only are the fuels and topography in this area very conducive to fire, but there is a high likelihood of an ignition due to the extreme recreational use. Campfires and ATV's are just a few of the potential human-caused ignition sources. Further increasing the risk is the popularity of wood siding, decking, and roofing on homes throughout the area. Many homes and other structures are crammed onto small lots between the lake shores and the access routes with forest fuels on the slope above and among the structures. In the event of a fire, these homes would form a continuous fuel bed that could facilitate the spread the fire from home to home.

The Town of Conconully was threatened during the Tripod Fire of 2006; thus, significant fuel reduction work was completed in order to help prevent the fire from destroying the entire community. Emergency thinning of forest stands and clearing of brush and slash within the townsite and surrounding area was conducted due to the high likelihood of the fire spreading directly towards Conconully. Efforts should be made to encourage residents and land managers to maintain this lessened fire risk condition.

#### **4.7.4.3.6 Mitigation Activities**

The best possible defense for homes in rural areas is to construct an adequate defensible space and maintain it annually. Keeping yards clean and green, mowing weeds around outbuildings, using fire resistant construction materials, and locating propane and firewood a safe distance away are just a few of the ways homeowners can decrease their fire risk. Safe access to homes by firefighters is also very important. Longer driveways, in particular, should have turnouts allowing two vehicles to pass, a large turnaround area near the structure, and be clear of overhanging branches or low clearance decorative arches. It is important for homeowners to know that firefighters will not risk their lives and equipment to save homes that they cannot safely access. Additionally, property owners should be aware that fire response organizations, including local districts and state and federal agencies, will honor "No Government Persons Allowed" signs, locally known as Constitutional Signs, during a wildfire event. If these signs are posted at the end of driveway, firefighters will not provide assistance to that home.

Residents and visitors in the Conconully community should be continually educated on the potential risks, ignition sources, and consequences of wildfire. Stringent restrictions on fire use, fireworks, and other potential ignition sources such as chainsaws should be strictly enforced, particularly during high fire risk periods. Trees and other landscaping surrounding structures that are close together should be pruned and as fire resistant as possible to avoid a fire spreading from one structure to another. The slopes rising out of this basin should also be treated to reduce the understory fuels as well as thinned to space out the canopy, which will help keep fires from crowning.

In other forested areas such as along State Route 20 and in the Chilliwist Valley, forestland owners can reduce their fire risk by conducting fuels reduction projects. Thinning overstocked

stands and removing non-commercial trees and other ladder fuels from the understory can significantly reduce their risk of loss to both their homes and their timber.

#### **4.7.4.4 Neighborhoods of Nine Mile and Mount Hull**

The Nine Mile and Mount Hull Neighborhoods extend from the edge of the Okanogan River Valley eastward into the mountains to overlook much of the communities of Oroville and Ellisforde. The Nine Mile Neighborhood extends from the U.S. border with Canada south to the Hailey Mountain area and encompasses the western extent of the Chesaw Road. Structures typically occur along this main travel corridor or in the recently developed Nine Mile subdivision. The Nine Mile subdivision includes many homes on large lots located on a series of private roads just west of Nine Mile Road.

The Mount Hull Neighborhood encompasses a higher density population of structures located on the moderate to steep south west to south to southeast slope extending from the edge of the Okanogan River Valley near Ellisforde eastward towards the community of Havillah and the Antoine Creek drainage. This area has been threatened by several large wildfires in the recent past.

##### **4.7.4.4.1 Fuels Assessment**

Fuels in the north half of the Nine Mile Neighborhood are primarily low to mid-length grasses and sagebrush. Very sparse stands of ponderosa pine are scattered along the upper slopes bordering the Nine Mile Road and within the Nine Mile drainage. These type of light, flashy fuels combined with a dry west aspect slope and predominantly southwest winds could culminate in very rapidly spreading, wind driven fire. The south half of the neighborhood includes much of a large block of Okanogan National Forest land. Moderate density stands of ponderosa pine, Douglas-fir, and western larch are predominant throughout this part of the National Forest. These forest-type fuels extend down slope into the populated Tonasket Creek drainage; however, becoming somewhat less dense as the elevation decreases. Fires in this type of fuel will burn with variable intensities mostly along the surface, but with occasional jackpotting, torching, and some crowning. The 2002 Nine Mile Fire burned 2,000 acres and three homes.

The Mount Hull Neighborhood is located on a moderate to steeply sloping west aspect face. This area is characterized by grass and sagebrush at the low to mid-elevations with an increasing occurrence of ponderosa pine on the upper slopes and ridge tops. The recent Rocky Hull Fire destroyed thirty-seven structures and caused significant tree mortality, particularly on the Okanogan National Forest. The Rocky Hull Fire burned in a southeasterly direction upslope through this area. The fire spread very quickly through the flashy fuels with occasional flare-ups and torching of individual or groups of trees as is evidenced by the patches of charred snags.

##### **4.7.4.4.2 Ingress-Egress**

The primary access through the Nine Mile Neighborhood is provided by the Chesaw Road, which is a paved, two lane route. The Nine Mile Road, a well-maintained graveled route takes off from the Chesaw Road to the north and loops around to the town of Molson. The Nine Mile Subdivision has several access points from either the Chesaw Road or the Nine Mile Road. All of the roads throughout the Nine Mile Subdivision are fairly wide, graveled routes; however, they do become very rough due to washboards without regular maintenance. Additionally, there are numerous one-way in, one-way out private driveways that lack pullouts or turnaround areas that would be sufficient for fire suppression equipment.

There is only one main access route through the Mount Hull area and that is the Swanson Mill Road traveling from the valley eastward to Havillah. This is a fairly well maintained gravel route; however, there are a few steep pitches and tight switchbacks. There are numerous spur roads and private driveways branching off the Swanson Mill Road to access groups or individual homes. These roads are typically one lane with a dirt surface and generally lack pullouts or turnaround areas. Many of these spurs or driveways are unmarked by either road names or addresses, which could make location of individual homes difficult for emergency services or fire suppression.

#### **4.7.4.4.3 Infrastructure**

Homes in the Nine Mile and Mount Hull Neighborhoods rely on personal or multiple home well systems. Electrical power is provided to most residents by above ground utility lines. It is probable that some homes in these neighborhoods are not connected to the power grid and/or do not have running water.

Residents in the Nine Mile and Mount Hull Neighborhoods receive electrical power via public distribution lines stemming from the main transmission line located in the Okanogan River valley.

#### **4.7.4.4.4 Fire Protection**

Residents on the east side of Nine Mile Road in the Nine Mile Subdivision have structural and wildland fire protection provided by the Okanogan County Fire Protection District #11. Most residents on the west side of Nine Mile Road are not within a rural fire protection district at this time. Most of the residents in the Mount Hull Neighborhood are protected by the Okanogan County Fire Protection District #12.

All of the Okanogan County fire districts have signed a “Memorandum of Understanding” to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.4.5 Community Assessment**

Residents in the Nine Mile Neighborhood have a high risk of being threatened by wildfire. Most of the populated areas are located within the more grassland/sagebrush type fuels; however, there is a high potential for a fire moving very rapidly upslope out of the valley near Osoyoos Lake. Recreational activities occurring around the lake create a high likelihood on an ignition due to the use of campfires, BBQ pits, fireworks, ATVs, and many other potential sources. Most of the homeowners in this neighborhood maintain a clean and green lawn, which will help deter a fire from their structures. Nevertheless, wood siding, decking, and roofing materials are popular construction materials.

Homes in the Mount Hull Neighborhood have a very high potential fire risk due to the steep slopes, dry west aspect, and flashy fuels. As was seen during the Mount Hull Fire, a wildfire in this area will spread very quickly with the potential to engulf many homes along its path. Many homeowners have not created an adequate defensible space by having high risk fuels directly abutting structures. Additionally, there are numerous unmarked private drives and spur roads that may not allow safe access by firefighting apparatus.

#### **4.7.4.4.6 Mitigation Activities**

The most effective mitigation activity for both the Nine Mile Neighborhood and the Mount Hull Neighborhood is to create a reasonable defensible space around structures. This includes maintaining a clean and green lawn (particularly on the downhill side), mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks and firewood away from structures. Additionally, all spur roads should be marked with road names and all private driveways should have clearly posted addresses. These activities can be done at a very low cost to the landowner and would significantly reduce the fire risk. The County and the developer of the Nine Mile Subdivision should also take care to keep the main access routes regularly maintained in order to reduce the development of washboards, which can increase the response time of emergency services.

#### **4.7.4.5 Neighborhoods of Molson – Chesaw, Pontiac Ridge, and Havillah**

The Molson-Chesaw, Pontiac Ridge, and Havillah Neighborhoods cover a large area in the northeastern-most corner of the County. These neighborhoods can be characterized as very rural in nature with scattered and widely spaced structures, many of which are larger landowners such as farmers and ranchers. Clusters of homes and other structures are found along Havillah Road, Chesaw Road, and Pontiac Ridge Road and in the unincorporated communities of Molson, Chesaw, and Havillah. There are also several resorts, guest ranches, and vacation homes throughout the area. Lost Lake and Bonaparte Lake, in the very rural southern regions of the Molson-Chesaw and Pontiac Ridge Neighborhoods, respectively, are nearly ringed by vacation or seasonal homes, summer camp facilities, and Forest Service campgrounds and visitor centers.

#### **4.7.4.5.1 Fuels Assessment**

The Molson-Chesaw Neighborhood is dominated by grasslands with small stands and stringers of ponderosa pine and Douglas-fir scattered throughout, particularly on the ridge tops and in the draws. Okanogan National Forest lands along the south and east boundaries of the neighborhood are predominantly timbered with ponderosa pine, Douglas-fir, and western larch being the dominant species. Fires in the grassland areas would be expected to burn at lower

intensities than a forest fire, but move very rapidly through the flashy fuels, especially under the influence of wind. Fires in the forested regions of this neighborhood would likely be much more intense with frequent crowning and torching due to the generally overcrowded conditions. The forested fuels around Lost Lake are very thick with abundant ladder fuels and dead and down material. Many of the structures around the lake including the Forest Service Center and Camp Tokiwanee were built using wood construction materials; thus, the buildings add to the potential fuel load.

Much of the Pontiac Ridge Neighborhood is included in the Okanogan National Forest. Fuels on this forest and on the surrounding private lands are predominantly Douglas-fir, ponderosa pine, and western larch. Historically, fires burned through this area fairly frequently; however, relatively successful fire suppression over the past century has resulted in fuel buildup in the understory and overcrowded conditions in the overstory. Slowly deteriorating forest health conditions can not only lead to more damaging wildfires, but also tends to invite insect and disease problems. Pine and Douglas-fir beetle infestations are on the rise in Eastern Washington and is evidenced in some timber stands in the Pontiac Ridge Neighborhood. A fire in this neighborhood would have a high likelihood of resulting in damaging losses to thousands of acres of timber. In addition, homes in this area may be difficult to protect due to the surrounding forest fuels and minimal access. Vacation homes and campgrounds at Bonaparte Lake, Beaver Lake, and Beth Lake directly abut forestland fuels. In many cases, these structures were built using wood construction materials; thereby, adding to the potential fuel load. The Forest Service is currently trying to reduce some of this risk by conducting fuel reduction projects on their land surrounding these structures.

Natural vegetation patterns were altered as farming and ranching began to develop around 1900 in the central and northern regions of the Havillah Neighborhood. Stands of timber were cleared for fields, which are still farmed and grazed today. This development has created a mosaic pattern of vegetation with a mix of open fields and timber across the landscape. State and National Forest lands in this neighborhood have remained in timbered status. Historically, forested areas were largely covered with large ponderosa pine on the drier sites and Douglas-fir and larch in more moist locations. After a century of relatively successful fire suppression, forest health has deteriorated due to overcrowding. Tree density, both in the canopy and the understory has increased as well as the build up of dead and down material along the forest floor. Formerly open pine stands have become inundated with regeneration and brush making the potential for an intense crown fire extremely high. The recent Barker Mountain Fire burned very intensely, spreading over ten miles in a single burn period. This fire burned numerous structures and thousands of acres of timber in the Havillah Neighborhood.

The Siwash Creek area in the southern region of the Havillah Neighborhood is primarily sagebrush and grasslands extending south and west to U.S. Highway 97 and State Route 20. This area has been partially developed for irrigated farming and ranching. Fires in this area will likely spread very quickly, but burn at varying intensities depending on the status of the crops and the water availability at the time of the fire.

#### **4.7.4.5.2 Ingress-Egress**

There are several main access routes in the Molson-Chesaw Neighborhood. The Chesaw Road is a paved access route traveling through the middle of the neighborhood and connecting the community of Chesaw to the population center of Oroville. The Molson Road from the town of Molson to the Chesaw Road and Nealey Road from the Havillah area to Chesaw are well-maintained graveled routes. These roads are primarily bordered by grassland fuels with

occasional forest stands. Forest Route 33 into Lost Lake from the south is a one-lane, paved route bordered by high risk forest-type fuels.

The Chesaw Road is also one of the primary travel corridors through the central part of Pontiac Ridge Neighborhood as well. The Bonaparte Lake Road is also a paved, two-lane route from State Route 20, passed Bonaparte Lake, and eventually connecting with the Chesaw Road. The Toroda Creek Road along the eastern edge of the neighborhood accesses many homes and is a well-maintained, graveled route with several secondary roads splitting off. The Pontiac Ridge Road is a graveled route accessing many homes in the Pontiac Ridge area; however, this road does not seem to be regularly maintained. There are also many un-addressed private driveways throughout the area. Most of the travel routes in the Pontiac Ridge Neighborhood abut forestland fuels and are in need of fuels reduction to insure safe passage during a wildfire. The Pontiac Ridge Road and the Bonaparte Lake Road have particularly high risk.

The main access through the Havillah Neighborhood is the Havillah Road, a paved, two-lane highway. For the most part, this corridor is reasonably clear of high wildfire risk fuels and could serve as a safe escape route from Havillah to Tonasket. Secondary roads in this neighborhood include Siwash Creek Road, North Siwash Creek Road, and Dry Gulch Road. These are typically well-maintained gravel routes bordered by grass, sagebrush, and patches of timber.

#### **4.7.4.5.3 Infrastructure**

Residents in the Molson-Chesaw, Pontiac Ridge, and Havillah Neighborhoods rely on personal or multiple home well systems.

A primary power transmission line travels over the pass into Okanogan County from neighboring Ferry County nearly paralleling State Route 20. This line branches near Bonaparte Lake Road with one leg ending at Bonaparte Lake and the other traveling north through the Toroda Creek drainage to the Chesaw area. Residents in the Molson-Chesaw, Pontiac Ridge, and Havillah Neighborhoods receive power via distribution lines from this main these main transmission lines or from the main line in the Okanogan River Valley.

#### **4.7.4.5.4 Fire Protection**

Most of the northern half of the Molson-Chesaw Neighborhood including the communities of Molson and Chesaw has structural and wildland fire protection provided by Okanogan County Fire Protection District #11. Residents in the Pontiac Ridge and Havillah Neighborhoods are not covered by any rural fire protection.

All of the Okanogan County fire districts have signed a "Memorandum of Understanding" to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.5.5 Community Assessment**

The Molson-Chesaw Neighborhood has moderate wildland fire risk. The typically grassland fuels in this area can allow for more effective fire suppression tactics; however, the potential for a very rapidly spreading fire is high due to the flashy fuels. Residents in this area may have very little time to prepare ahead of an advancing flame front. Grazing and farming in this neighborhood helps keep the fuels down during the fire season and most homes have an adequate defensible space around their structures. The homes and camp facilities at Lost Lake have a much higher potential fire risk. Not only are the access routes into the lake bordered by high risk forest fuels, but the structures also abut and intermingle with dense forest conditions. In most cases, structures around the lake were constructed using wood building materials; thus, they have become part of the potential fuel complex. In the event of a fire near Lost Lake, these structures would be very difficult and dangerous for firefighters to protect and would have a very high risk of complete loss.

The Pontiac Ridge Neighborhood has a very high risk of experiencing a damaging wildfire. The Okanogan National Forest in this area is generally overcrowded with increasing occurrences of insect and disease problems resulting from the stress. Residents in this area are very widely scattered with limited access abilities. Unmarked, one-way in, one-way out driveways bordered by high risk forest fuels are common throughout the area. Homes and other structures surrounding Bonaparte Lake also have a very high risk. Many of these are wood sided vacation homes with timber and other fuels abutting or even overhanging the roofs. Residents in the Pontiac Ridge Neighborhood lack fire protection by a rural district.

The Havillah Neighborhood has a high risk of experiencing a wildland fire. The community of Havillah has several structures nearing 100 years old and is listed as historical site. The combination of higher risk fuels with rural homes widely scattered throughout exasperate this situation. A tremendous amount of suppression resources is needed to protect structures that are sometimes miles apart. While the Havillah Neighborhood currently does not have structural or wildland fire protection by a rural fire district; the Washington DNR does provide wildland fire protection due to much of the area paying the Forest Patrol Assessment tax. Residents in the area often use local farm and ranch implements to help create fuel breaks and fire lines. Deteriorating forest health conditions resulting from overcrowding, insects, and disease further increase the potential for an intense, possibly stand replacing fire.

Several local landowners in all of these neighborhoods have created defensible space around their homes and have begun the process of reducing fuel loading on their land. Treating fuels after thinning is critical to reducing the fire risk.



#### **4.7.4.5.6 Mitigation Activities**

All residents in the Molson-Chesaw, Pontiac Ridge, and Havillah Neighborhoods should maintain a defensible space around their structures; however, this is particularly important in forest areas. Many homes in the Pontiac Ridge and Havillah Neighborhoods are surrounded by continuous forestlands. It is very important that these homeowners maintain a clean and green yard and prune large trees around their structures. Trees directly abutting or overhanging structures should be considered for removal as this a very high risk factor for igniting the home. Broader scale fuels reduction projects should be considered around the recreational homes and camp facilities at Bonaparte Lake and Lost Lake as these areas are at very high risk to wildfires.

County roads in these neighborhoods are typically well-signed; however, private driveways are not. Visible rural addressing signs are very helpful for locating individual structures by emergency response personnel. Additionally, private driveways should be have turnouts allowing two vehicles to pass, a turnaround area large enough for a fire truck, and be clear of overhead obstructions. Residents should be aware that firefighters will not risk their lives or their equipment to save a home.

The Pontiac Ridge and Havillah Neighborhoods both lack rural fire protection. The Havillah Community Wildfire Protection Plan stresses the need to form a district for fire protection in this neighborhood.

Due to the large amount of acreage covered by the Okanogan National Forest in the Molson-Chesaw, Pontiac Ridge, and Havillah Neighborhoods, management of timbered stands abutting and/or near populated areas is critical. Fuels reduction projects on Forest Service managed lands can significantly reduce the fire risk to privately owned timber and structures.

The Havillah Community Wildfire Protection Plan has been drafted for a portion of the Havillah Neighborhood. Extensive local research and planning went into the development of this plan; therefore, specific recommendations outlined in that document should also be supported.

#### **4.7.4.6 Neighborhoods of Wauconda, Tunk – Chewiliken, and Aeneas Valley**

The Wauconda, Tunk-Chewiliken, and Aeneas Valley Neighborhoods cover a large part of east-central Okanogan County. There are many structures scattered all throughout these neighborhoods, typically on relatively large tracts of land.

The Wauconda Neighborhood stretches from the edge of the Okanogan River Valley at Tonasket eastward along State Route 20 to the County boundary. There are many structures scattered throughout this neighborhood particularly between Tonasket and the Aeneas Valley.

The Tunk-Chewiliken Neighborhood is characterized by two distinct valleys. The larger of the two, Tunk Valley, comprises the Tunk Creek watershed and is home to scattered structures in a rural setting throughout its extent. Tunk Valley is a high, box canyon enclosed by mountains on the south, east, and north sides. The Chewiliken Valley is located just over the ridge to the north of the Tunk Valley. This is a much smaller basin formed by Chewiliken Creek. Structures in this area tend to be concentrated along Chewiliken Road and McLaughlin Canyon Road. The recreational area of Crawfish Lake sits in the southeast end of the Neighborhood. There is a developed campsite and boat launches on the northern shore while a multitude of cabins and seasonal homes are tucked into the timber on the along the southern shore.

The Aeneas Valley Neighborhood is centrally located along the eastern Okanogan County border and encompasses a dense population cluster within the Aeneas Valley. The Aeneas Valley itself is a relatively large, flat bottomed valley defined by moderate to steep slopes. Most of the structures in this neighborhood are located within or near the valley floor; however,

development has occurred on many of the numerous secondary roads heading into the mountainous regions to the northeast and southwest. The Cape Labelle Road, which eventually connects to State Route 20 near Wauconda, as well as the Frosty Creek and Coco Mountain areas have had considerable development in recent years.

#### **4.7.4.6.1 Fuels Assessment**

State Route 20 parallels the main stem of Bonaparte Creek from Tonasket to Bonaparte Lake Road near the community of Wauconda in the Wauconda Neighborhood. Fuels in this part of the Bonaparte Creek drainage are mostly low to mid-length grasses with scattered sagebrush. Sparse ponderosa pine occurs along some of the ridge tops on both sides of the valley. Fires in these grassland fuels will tend to spread very rapidly, but burn at low and moderate intensities. Occasional flare-ups will occur in areas where sagebrush is more prominent. Winds blowing up the valley may encourage rapid fire spread upslope. Forestlands begin to become more prominent near Wauconda with increasing densities eastward to the County line. These forestlands are made up of mixed stands of ponderosa pine, Douglas-fir, and western larch. Ladder fuels, brush, and dead and down material are prominent in the understory throughout most of this area; however, some landowners along State Route 20 have completed fuel reduction projects. A fire in these forestlands would likely burn at varying degrees of intensity depending on the fuel loading. Higher rates of tree mortality will occur in stands that are overcrowded or have not been treated.

Fuels within the Tunk and Chewiliken Valleys in the Tunk-Chewiliken Neighborhood are primarily sagebrush and grasses. Several landowners have converted the native vegetation to pasture for livestock or hay production. Sparse and discontinuous stands of ponderosa pine occur along the ridge between the two valleys. The upper extent of the Tunk Valley including Crawfish Lake and continuing along the ridge flanking the south side of the valley is blanketed by dense forestlands. Ponderosa pine, Douglas-fir, western larch, subalpine fir, and lodgepole pine are the prominent overstory species. Although some thinning of the understory has occurred in the Crawfish Lake campground, the fuels bordering the lake and extending in all directions would support a very intense wildfire. Crowning and other extreme fire behavior would likely result in high rates of tree mortality throughout much of this area.

The Aeneas Valley constitutes the primary topographic feature in the Aeneas Valley Neighborhood. The valley itself has a broad bottom that has been developed for either residences, pasture, or agricultural production. Numerous small streams drain from the surrounding mountains into the valley. Instead of a continuous stream running through the valley bottom, there is a series of lakes and marshy areas that collect the runoff on the north end while the West Fork of the Sanpoil River drains the southern end of the valley. The slope rising from the southwest side of valley is forested with Douglas-fir, ponderosa pine, and western larch, which extends into the Okanogan National Forest lands to the west and south. The slope rising from the northeast side of the valley is only partially forested with scattered stands of ponderosa pine and some Douglas-fir amid the dominant sagebrush and grass vegetation. Fires on the southwest aspect would likely spread very quickly upslope through the flashy fuels while fires on the more densely forested northeast aspect would be much more intense with frequent crowning, torching, and jackpotting. Smoke from fires burning in the area would likely settle in the Aeneas Valley potentially causing health problems for residents. Many of the smaller drainages may act as a funnel for hot gases and fumes during a wildfire. Fires in the Aeneas Valley Neighborhood may be difficult and dangerous for fire suppression personnel due to the topography, access, and potential for extreme fire behavior.

#### **4.7.4.6.2 Ingress-Egress**

The main access through the Wauconda Neighborhood is State Route 20, which is a paved, two-lane highway. There are also several secondary roads branching off of the highway that access groups of homes throughout the area such as Talkire Lake Road, Aeneas Valley Road, Bonaparte Lake Road, and Cape Labelle Road. These routes are typically well maintained graveled roads.

The road system in the Tunk-Chewiliken Neighborhood is made up of Tunk Creek Road in the Tunk Valley and the McLaughlin Canyon Road in the Chewiliken Valley. Chewiliken Road and Upper Chewiliken Valley Road provide access via graveled routes over the ridge between the two valleys. The Tunk Creek Road is a two-lane, paved route, but all other access routes in this neighborhood are graveled. With the exception of the southern extent of the Tunk Creek Road, these routes travel through sage and grassland fuels. Numerous private drives access individual homes or groups of homes in this area. Many of these are not addressed and several are gated.

The Aeneas Valley Road is the primary access route in the Aeneas Valley Neighborhood. This is a paved, two lane route until it reaches the Okanogan National Forest boundary on the south end of the neighborhood. The Aeneas Valley Road does provide through access across the National Forest into Ferry County via several forest routes; however, these are not likely to be the safest evacuation routes during a wildfire situation. The Lyman Lake-Moses Meadows branches is a well maintained, graveled route that branches off the Aeneas Valley Road and travels in a southwesterly direction eventually connecting to State Route 155. There is a multitude of graveled secondary roads originating from the Aeneas Valley Road that access homes on the surrounding slopes. For the most part these are well signed; however, private drives do not always exhibit a visible address or road name.

#### **4.7.4.6.3 Infrastructure**

Residents in the Wauconda, Tunk-Chewiliken, and Aeneas Valley Neighborhoods rely on personal or multiple home well systems.

The Wauconda Neighborhood receives electrical power from the main transmission line along State Route 20. Residents in the Aeneas Valley area receive power either from the State Route 20 transmission line or from the transmission line that enters the valley from the south along the Lyman Lakes-Moses Meadows Road.

The primary electrical transmission lines that feed Tunk Valley belong to the Okanogan County PUD. These lines enter the valley by crossing the mountains to the north from the Aeneas Valley to the old town site of Synarep. At Synarep, the line splits, with one leg routed east up the valley and the other west down the valley. In addition to private residences, the upper valley line feeds a private line, which in turn feeds the Tunk Mountain communications site. Communication facilities on Tunk Mountain include: U.S Forest Service, Okanogan County Sheriff, Okanogan County Public Works Department, Day Wireless Systems, Bonneville Power Administration, U.S. Border Patrol, NOAA Tsunami Warning System, and Washington State Patrol. The upper valley line currently ends at the Twin Lakes Subdivision, but PUD has plans to extend it under ground to Crawfish Lake. This will eliminate 6.5 miles of overhead line, which comes from Moses Meadow through National Forest lands. The lower valley leg of the line feeds several private residences as well as the Omak Mountain communications site. Communication facilities on Omak Mountain include: TV Reflector Association, Bureau of Indian Affairs, Unicel, and Day Wireless (Verizon). Much of the existing above ground electrical

installations consist of the original 1950's equipment; however, new underground services are being installed.

#### **4.7.4.6.4 Fire Protection**

Okanogan County Fire Protection District #4 provides structural and wildland fire protection along State Route 20 from Tonasket up to the Aeneas Valley Road and the Ferry/Okanogan County Fire Protection District #13 covers a small piece along State Route 20 near the County line. The Tunk-Chewiliken and Aeneas Valley Neighborhoods currently have no organized rural fire protection; thus, there is no structural protection for homes in these areas. However, efforts have been made in both areas to form fire districts. Individual residents in the Tunk Valley have purchased land they hope will eventually house a small fire department. It should be noted that it is 28 miles of gradual incline from the beginning of Tunk Creek Road near Riverside to its culmination at Crawfish Lake; thus the response time for a neighboring fire department to respond to a fire in the upper extent of Tunk Valley could be significant. In the Aeneas Valley an attempt was made to form a fire district, but this enterprise had not yet gained the popular vote of the majority of the residents. Formation of an Aeneas Valley Fire Department will again be on the ballot in November 2006. Supporters are optimistic that the Fire Department will pass with a majority vote in favor this time around.

Due to the high density of structures in both the Aeneas Valley and the Tunk Valley, the Okanogan County Fire Protection Districts as well as the DNR and Forest Service support the formation of rural fire departments in these areas.

All of the Okanogan County fire districts have signed a "Memorandum of Understanding" to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.6.5 Community Assessment**

The Wauconda Neighborhood is at moderate risk of experiencing a wildfire. The well traveled State Route 20 increases the potential for an ignition from car exhaust, cigarettes, or other man-

made source. Nevertheless, most of the homes are located in the grass and sage fuels on the west side of this neighborhood. Homeowners typically have created a defensible space around their structures by maintaining a clean and green yard. There are a few homeowners located in the forested areas near Wauconda that have an increased risk due to these fuels.

Residents in the Chewiliken Valley of the Tunk-Chewiliken Neighborhood also have moderate fire risk due to the grass and sage fuels. Fires in this type of fuel are generally easier to contain, particularly when farm and ranch implements are available for building temporary fuel breaks.

The Tunk Valley has a much more increased fire risk due to the dense forest fuels along the southern edge of the valley. These forest lands would likely burn very intensely with the possibility of spreading or throwing fire brands into the flashy fuels within the valley. The lack of a local fire department increases the fire risk to residents in this neighborhood. The Tunk Valley is beginning to see an increased rate of development with many of the new homes and subdivisions in high risk areas. The Twin Creeks subdivision is at the upper end of the valley. This is a 2,500 acre property subdivided into approximately 124 parcels. Many of these parcels are used primarily for recreation, but there are some year-round residences. The access roads into this subdivision are initially two-lane graveled routes, but they quickly deteriorate to dirt surface dead ends. Most of these parcels are timbered and some have a large amount of logging debris scattered throughout. Some of the roads are on very steep terrain and do not have turnouts or turnarounds. Several landowners keep their private drives gated and locked and most do not have visible addresses. In addition, there is currently 3,000 additional acres in Tunk Valley that have been subdivided into typically 20 acre parcels.

Crawfish Lake in the southern end of the Tunk-Chewiliken Neighborhood has a very high risk of experiencing a damaging wildfire. The 44 homes and cabins in this area are very close together with trees and other fuels directly abutting or even overhanging roofs. The road accessing structures around the lake is a one-lane, dirt road that is gated on both ends. There are very few turnouts or areas large enough to turn fire suppression equipment around. Additionally, high risk forest fuels crowd and overhang the road way. The Forest Service campground on the north side of the lake has had some fuel reduction treatments in the understory; however, the overstory is still relatively dense in some areas. Due to the intensity of the recreational use in conjunction with the high risk fuels, a fire in the Crawfish Lake area would likely result in damage or complete loss of structures as well as the campground facilities.

Most of the structures in the Aeneas Valley Neighborhood are located within or very near the Aeneas Valley. This area maintains its rural nature; however, it is actually relatively densely populated with about 2,000 residents. Homes within the valley bottom have a moderate to high risk of incurring the effects of a damaging wildfire due to the grassy fuels and availability of water. Nevertheless, homes along the slopes bordering both sides of the valley have a very high fire risk. Human activities throughout the neighborhood present many potential ignition sources and lightning strikes occur frequently throughout the area. Poor ingress/egress routes in the Aeneas Valley areas exacerbates the already high fire danger. Nearly all of the major routes are bordered by high risk fuels at some point and there are numerous dead end roads and driveways. In the event of a wildfire, the Aeneas Valley Road to State Route 20 is likely to be the only safe evacuation route.

The lack of an organized fire department located within the Aeneas Valley drastically increases the fire risk to residents. It can take up to an hour or longer for the nearest fire suppression resources to respond to a wildfire emergency in the Aeneas Valley. Additionally, many of the private driveways do not have visible addressing making locating individual homes difficult for firefighters. Some of these driveways are also unsafe for suppression equipment due to low clearance, fuels abutting the roadway, and/or the lack of sufficient turnouts and turnarounds.

#### **4.7.4.6.6 Mitigation Activities**

The creation and maintenance of a defensible space around structures in the Wauconda, Tunk-Chewiliken, and Aeneas Valley Neighborhoods is generally the best line of defense for homeowners. In many cases, this can be done by simple mowing of the surrounding vegetation and using fire resistant construction materials wherever possible; thus, education for homeowners on how to create an adequate defensible space would be a very cost effective way to reduce the potential risk to individuals.

Homeowners in forested areas should be especially vigilant about maintaining a defensible space around structures. Fuels around structures and along roads in the Crawfish Lake area are in desperate need of thinning and removal of ladder fuels and dead and down debris in the understory both immediately surrounding structures and extending into the forestlands. Establishing a more fire resistant community defensible zone in this area will help reduce the intensity of a wildland fire before it reaches structures. This type of project can be done without reducing the aesthetic value of the lake.

Alternative escape routes such as the Lyman Lake-Moses Meadows Road, Talkire Lake Road, Brown's Pass Road, and Crawfish Lake Road are in need of improvement. Widening, surface maintenance, and roadside fuels reduction are needed to insure these routes are capable of serving as a safe travel corridors during a wildfire. Additionally, homeowners should be made aware of the necessity of visible addressing as well as driveways that can safely accommodate large fire suppression apparatus.

The Tunk-Chewiliken and Aeneas Valley Neighborhoods would have much less risk of damage or loss with the formation of localized fire departments. More and more homes are being built in these areas and without some kind of nearby fire protection; the potential for fires spreading undeterred from home to home is very high.

The improvement of forest health on both private and public land in the Aeneas Valley, Tunk Valley, and Crawfish Lake areas would help reduce the likelihood of a widespread stand replacing wildfire. Very successful fire suppression, lack of active management, and insect and disease outbreaks have resulted in forest conditions that are very conducive to intense and very damaging fires.

#### **4.7.4.7 Neighborhoods of Disautel and Timentwa**

The Disautel and Timentwa Neighborhoods cover a very large region east of the Okanogan River Valley near Omak and Okanogan. These neighborhoods are very sparsely populated. Most of the structures are concentrated along the State Route 155 corridor in French Valley or in the Cameron Lake area just to the southeast of Okanogan. The Timentwa Neighborhood also contains Omak Lake and numerous small lakes sometimes referred to as "pothole" lakes.

##### **4.7.4.7.1 Fuels Assessment**

Most of the residences in the Disautel Neighborhood are located within the French Valley, which is primarily grassland and sagebrush fuels. Outside of the valley, scattered ponderosa pine and Douglas-fir are present on the mid and upper slopes, but becoming continuous and denser to the north and east. Fuels in the French Valley area would tend to support a fast moving, but lower intensity wildfire. Smoke and other hot gases and fumes may hang in the valley causing health problems for those at risk. Fires in the forested areas on the east side of the Disautel Neighborhood would likely burn at a higher intensity. In less dense stands, fires will tend to

move very quickly along the surface, but in more dense or overcrowded stands fires may burn very intensely with a much higher occurrence of torching and crowning.

The Timentwa Neighborhood is almost completely dominated by sagebrush and grassland fuels. There are a few very sparse stands of ponderosa pine around Cameron Lake and on the western ridge above Omak Lake. Also, a moderately dense stand of ponderosa pine and Douglas-fir is present in the Whitmore Mountain area. Fires in the Timentwa Neighborhood will tend to be rapidly spreading surface fires. Under the influence of wind, a fire in this area could move through the flashy fuels in a matter of minutes. The forest fuels in the Whitmore Mountain area would likely support a more intense fire with occasional jackpotting and torching of individual or groups of trees.

#### **4.7.4.7.2 Ingress-Egress**

The main route through the Disautel Neighborhood is the State Route 155 corridor, a paved, two-lane highway. The Lyman Lake Road is a well-maintained, gravel connecting route between State Route 155 and the Aeneas Valley. There are only a few other secondary roads, most of which are in French Valley, that access homes throughout the area. These are typically graveled routes.

The Timentwa Neighborhood covers a very large area, but there are only a few primary routes. The Wakefield-Cameron Lake Road makes a big loop from Highway 97 near Okanogan, south through the LaFleur area, then reconnects with Highway 97 near Monse. This is a fairly well maintained gravel road with plenty of room for two vehicles to pass. The Columbia River Road is a paved, two-lane highway traveling from Omak, passed Omak Lake, through Goose Flats, and then along the Columbia River eastward to the Colville Indian Agency. There are a few secondary roads including Timentwa Road, Greenaway Road, Omak Lake Road, North End Omak Lake Road, and Soap Lake Road that crisscross this neighborhood. These roads are typically fairly well-maintained graveled routes.

#### **4.7.4.7.3 Infrastructure**

There are no identified communities in either the Disautel or the Timentwa Neighborhood; thus, residents in these areas rely on personal well systems. Power is provided by above ground transmission lines.

The main Bonneville Power Administration transmission line crosses through the middle of the Timentwa Neighborhood to substations in the Okanogan area. Another transmission line originating in Omak travels along State Route 155 through the Disautel Neighborhood.

#### **4.7.4.7.4 Fire Protection**

Most of the Timentwa Neighborhood has structural and wildland fire protection provided by the Okanogan County Fire Protection District #8. There is no rural fire protection in the Disautel Neighborhood. The Bureau of Indian Affairs provides wildland fire protection with the Confederated Tribes of the Colville Reservation.

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1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).

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3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.7.5 Community Assessment**

The Disautel and Timentwa Neighborhoods have a moderate risk to wildfire. Most of the residents in both of these neighborhoods are surrounded by sage and grassland fuels. Homeowners should be aware that fires in these areas will likely spread very rapidly giving them little time to prepare and evacuate ahead of the flame front.

Homes in the Cameron Lake area of the Timentwa Neighborhood and Haley Creek area in the Disautel Neighborhood have a slightly higher potential fire risk due to the presence of ponderosa pine around their homes. Homes with trees very near or even overhanging roofs are at very high risk.

Recreational activities around Omak Lake could easily spark a fire that could spread into the surrounding areas very quickly. Campfires, ATV and boat motors, BBQ pits, and fireworks are just a few of the potential ignition sources.

#### **4.7.4.7.6 Mitigation Activities**

Both the Disautel and Timentwa Neighborhoods are very rural parts of the County. The best defense against wildfire in these areas is for homeowners to create a defensible space around structures, particularly those in the Disautel Neighborhood who are not within a fire protection district. Maintaining a clean and green lawn and mowing grass and weeds away from structures will go a long way to deter fire away from a home. Homeowners can drastically reduce their risk of loss due to fires by supporting the formation of a rural fire district in areas where homes occur and there is currently no protection.

Public education of the potential ignition sources and the consequences can help prevent and accidental ignition. Awareness of the fire risk is especially important in recreational areas.

#### **4.7.4.8 Neighborhoods of Nespelem and Coulee Dam**

The Nespelem and Coulee Dam Neighborhoods are located in the southeastern tip of Okanogan County. The Nespelem Neighborhood includes the communities of Nespelem and Colville Agency with most of the structures occurring nearby. The Columbia River forms the southern and western border of the Coulee Dam Neighborhood with Grand Coulee Dam



occurring at the southwestern tip. Nearly all of the structures in this neighborhood are found in the immediate vicinity of the incorporated cities of Coulee Dam and Elmer City.

#### **4.7.4.8.1 Fuels Assessment**

Fuels in the Nespelem and Coulee Dam Neighborhoods are fairly consistent. Much of this area is covered by low growing grasses and sagebrush with some scattered ponderosa pine in the draws. Dense riparian fuels including black cottonwoods and willows are prominent along the Nespelem River and the Little Nespelem River. Fires occurring throughout these neighborhoods would be expected to spread very rapidly, but burn with a moderate intensity through the flashy fuels. The riparian vegetation along the waterways may support a more intense fire later in the summer as the water levels go down and fuels become dry.

The north end of the Nespelem Neighborhood is partially forested with ponderosa pine and Douglas-fir being the primary overstory species. Several landowners have conducted both commercial and pre-commercial thinnings along State Route 155, which, with slash treatment, helps reduce the potential for an intense fire around homes in this area.

#### **4.7.4.8.2 Ingress-Egress**

The primary access route through the Nespelem and Coulee Dam Neighborhoods is State Route 155, a paved, two-lane highway. The Columbia River Road is also a paved, two-lane highway traveling from Colville Agency west along the Columbia River. There are several secondary roads throughout the area accessing homes or recreational areas. These roads are typically regularly maintained, graveled routes. Gold Lake Road and Cache Creek Road are graveled routes heading from Nespelem north and east, respectively, into neighboring Ferry County. Other secondary roads include Moses Road, Buffalo Lake Road, Rebecca Lake Road, Peter Dan Road

#### **4.7.4.8.3 Infrastructure**

Residents in the communities of Nespelem, Elmer City, and Coulee Dam have access to the municipal water system. Homes outside of the city limits rely on personal well systems.

Two Bonneville Power Administration transmission lines are located within the Nespelem and Coulee Dam Neighborhoods. One of these lines ends at Colville Agency, while the other passes through the bottom half of the Coulee Dam Neighborhood.

Grand Coulee Dam on the Columbia River is located in the southwestern tip of the Coulee Dam Neighborhood. The Grand Coulee Dam, located on the Columbia River in central Washington, is the largest concrete structure in the United States. It forms the centerpiece of the Columbia Basin Project, a multipurpose endeavor managed by the U.S. Bureau of Reclamation. In addition to producing up to 6.5 million kilowatts of power, the dam irrigates over half a million acres of Columbia River basin farm land and provides abundant wildlife and recreation areas.

#### **4.7.4.8.4 Fire Protection**

Okanogan County Fire Protection District #2 is responsible for structural and wildland fire protection within and immediately surrounding the town of Elmer City and the unincorporated communities of Lone Pine, Koontzville, and Seatons Grove. There is a currently an active effort to annex the villages of Belvedere to the north and McGinnis Lake to the east, which will effectively double the size of the district.

Structures in the communities of Nespelem and Colville Agency currently have no organized structural fire protection. The Bureau of Indian Affairs provides wildland fire protection on all lands within the Confederated Tribes of the Colville Reservation.

All of the Okanogan County fire districts have signed a “Memorandum of Understanding” to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on private lands based on a reciprocal agreement with the DNR.

#### **4.7.4.8.5 Community Assessment**

Communities in the Nespelem and Coulee Dam Neighborhoods are at moderate risk of wildland fire. Most of the structures in these neighborhoods are located within or very near the community centers. Residents generally keep the grass and other fuels around their homes to a minimum by mowing or grazing livestock.

High density recreational activities along the Columbia River and at Buffalo Lake and McGinnis Lake increases the likelihood of an accidental ignition due to the use of campfires, fireworks, BBQ pits, ATVs, or several other potential sources. Cultural burning by members of the Tribe usually occurs during the spring months; however, there is a potential for these small burns to spread to unintended areas or threaten homes.

The highly productive vegetation in the Nespelem River, Little Nespelem River, and other drainages has the potential to burn very intensely. A severe fire in these corridors has an increased possibility of damaging the ecosystem of the waterway as this type of vegetation is not usually very resilient after a burn. Furthermore, a fire in these fuels could potentially threaten many homes as it spreads through the dense fuels along the stream and river banks.

All of the residents in the Nespelem Neighborhood and many in the Coulee Dam Neighborhood are currently without rural fire protection. This could lead to delayed response times as resources are called from out of the area to respond to a structural or wildland fire situation.

#### **4.7.4.8.6 Mitigation Activities**

The grass and sagebrush fuels in the Nespelem and Coulee Dam Neighborhoods are very conducive to rapidly spreading surface fires. During a wildfire event, families in threatened structures would have very little time to protect their homes and evacuate. Therefore, it is very important that a defensible space is maintained around structures prior to an ignition. Keeping a clean and green yard and using fire resistant construction materials at least around the base of homes and other structures will help reduce the risk of loss to fire. Homeowners along the Nespelem and Little Nespelem Rivers should be even more vigilant about maintaining a fuel break between the riparian fuels within the waterway and their homes as fires could burn much more intensely in those areas.

The use of the campfires, fireworks, and other potential ignition sources should be highly regulated during the fire season. Using escape proof fire rings and BBQ pits at recreational areas, limiting off-road vehicle use to designated trails, and restricting fireworks will help reduce the potential for an ignition.

Forming a rural fire protection district around the communities of Nespelem and Colville Agency will significantly increase the protection of residents in these areas from structural and wildland fires.

### **4.7.5 Methow River Valley**

#### **4.7.5.1 Neighborhoods of Winthrop, Twisp – Carlton, and Lower Methow**

The Winthrop, Twisp-Carlton, and Lower Methow Neighborhoods are located within the Methow River drainage. The Winthrop Neighborhood is the farthest north in this group and includes the incorporated town of Winthrop and the associated areas of Twin Lakes, Pearrygin Lake, and Davis Lake. This neighborhood is relatively densely populated.

The Twisp-Carlton Neighborhood is located between the Winthrop and Lower Methow Neighborhoods and includes the incorporated town of Twisp as well as the unincorporated community of Carlton. Most of the structures in this neighborhood are located within or near the valley bottom; however, there are clusters of homes in the Libby Creek, Alder Creek, Benson Creek, Poorman Creek, Leecher Creek, Texas Creek, Beaver Creek, and along the State Route 20 corridor.

The Lower Methow Neighborhood is located along the southern most extent of the Methow River and encompasses the unincorporated community of Methow. Alta Lake State Park is located near the southern tip of this neighborhood. A recreation-based community has developed around Alta Lake and the park with many homes, cabins, campsites, boat ramps, stores, and even a golf course. Several homes are also located in the Gold Creek, Squaw Creek, Black Canyon Creek, McFarland Creek, and French Creek drainages.

##### **4.7.5.1.1 Fuels Assessment**

Fuels in the Winthrop Neighborhood consist mostly of sagebrush and mid-length grasses on the surrounding hillsides and valley bottom. Around the Pearrygin Lake State Park, the grass is kept well watered and mowed except for a narrow border of riparian vegetation immediately surrounding the lake. Within the valley, much of the native vegetation has been converted to livestock pasture, agricultural fields, or residential development. Riparian vegetation including black cottonwoods, willows, and other hardwoods are present along the Methow River and Chewuch River banks. There are also a few stringers of sparse ponderosa pine in some of the

smaller draws. A fire in these fuels would be expected to spread very rapidly through the flashy fuels; however, the extensive development and current road system breaks the continuity of the fuels helping make suppression tactics more effective.

The Methow River Valley and the surrounding hillsides in the Twisp-Carlton Neighborhood consist primarily of grass and sage fuels. Agricultural and residential development along the valley bottom has resulted in a patchwork of irrigated crops and home sites. Near the Twisp and Carlton community centers and along the river banks deciduous trees add to the highly productive riparian vegetation. Ponderosa pine and Douglas-fir forests along some of the more distant ridge tops tend to become more dense and continuous to the east and west extending into the Okanogan National Forest on each side of the valley. Several of the developed drainages including Libby Creek and Benson Creek and along State Route 20 (Frazer Creek) within the National Forest have similar fuel compositions consisting of shrub steppe leading into moderate to dense fir stands on the north slopes and low to moderate density ponderosa pine on the south slopes. Fires in the grass and sage fuels of the valley would be expected to spread rapidly, particularly upslope, but burn at low to moderate intensities. Open pine and fir stands would likely support surface fires with only occasional jackpotting of slash piles or other fuels. Further to the east and west in the more forested areas outside the Methow River Valley, wildfires would likely burn more intensely and cause more mortality of the trees.

The fuels within the Methow River Valley throughout the Lower Methow Neighborhood are consistent with those in the Winthrop and Twisp-Carlton Neighborhoods. Sagebrush and grasses cover the rolling hillsides on both the east and west slopes. Agricultural development is prominent in the valley bottom and lower benches, particularly in the south end of the neighborhood closer to the mouth of the river. Sparse stands of ponderosa pine and Douglas-fir begin to occur about mid-slope on the west side of the valley and become more continuous and much more dense as the elevation increases. The north aspect in several of the smaller drainages on the west side of the valley such as Gold Creek, Squaw Creek, McFarland Creek, and Black Canyon Creek are also moderately to densely forested by ponderosa pine and Douglas-fir. The sagebrush and grass fuel complex extends further east on the east side of the valley. In some areas the shrub steppe ecosystems transition to old growth bitterbrush, which contains extremely volatile compounds. Much of the Buckhorn Mountain area is covered with grass and sage with only occasional stands of sparse ponderosa pine. Stands of ponderosa pine become more continuous near the upper extent of the French Creek drainage. Many of these stands are old reforested rye fields that have become overgrown. High grading of the timber has also caused many stands in the French Creek area to become overpopulated with small diameter stems and excessive ladder fuels. French Creek, Gold Creek (all forks), Squaw Creek, and Black Canyon Creek are all primed for big fire events due to the excessive fuels.

Ponderosa pine and some Douglas-fir are also present on the slopes surrounding Alta Lake and Alta Lake State Park. Fires within the Methow River Valley in the Lower Methow Neighborhood would tend to be low to moderate intensity surface fires. Agricultural and residential development along the valley floor and lower slopes tends to break up the fuel continuity, which helps slow the spread of fire. The forest stands in much of this neighborhood would tend to support moderate intensity fires with occasional crowning, torching, and jackpotting in areas with higher accumulations of fuels.

#### **4.7.5.1.2 Ingress-Egress**

The primary access route from Twisp south is State Route 153, which is a paved, two-lane highway. State Route 20 is also a paved, two-lane highway that travels over Loup Loup Summit from the Okanogan River Valley, turns north at Twisp, passes through Winthrop, then heads

west over the mountains via the North Cascades Highway. There is also a multitude of secondary roads accessing homes and other more rural parts of these neighborhoods. These roads are typically well-maintained gravel routes that travel up drainages. The access route into Alta Lake is a paved, two-lane route. The Gold Creek Road is also paved for a few miles up, but mostly as a single lane with pullouts. The Gold Creek Road does connect to the Libby Creek drainage to the north; however, this is a dirt road bordered by forest type fuels.

Several of the roads accessing homes in some of the small tributaries dead end or become dirt forest routes. Of particular concern is the Alta Lake Road, which dead ends near the south end of Alta Lake. This is the sole access route into this heavily populated area. French Creek Road is the sole access route for residents in the upper French Creek drainage. This road does connect to the Texas Creek Road to the north; however, part of this route is accessible by 4x4 vehicles only. The lack of an alternate escape route puts residents in these areas at much higher fire risk.

#### **4.7.5.1.3 Infrastructure**

Residents within the communities of Winthrop and Twisp have access to municipal water systems. All other residents in the Winthrop, Twisp-Carlton, and Lower Methow Neighborhoods rely on personal or multiple home well systems.

Okanogan Public Utility District (PUD) and Okanogan Rural Electric Cooperative (OCEC) provide electrical service to the Methow Valley. Most of the Methow Valley's electricity needs are presently served by a single transmission line, which starts in Okanogan at a substation and follows the route of State Route 20 over Loup Loup Pass to the Twisp substation in the town of Twisp. Okanogan PUD is responsible for maintaining the transmission line under an agreement between the two utilities and the Bonneville Power Administration. Okanogan PUD is currently engaged in an environmental review process to determine whether to construct a second transmission line to serve the valley. This second route would either be located in the upland hills on the east side of the valley or along the valley floor adjacent to State Route 153. Additionally, the valley's residents are served by a network of distribution lines that connect the transmission line to homes and businesses. The Okanogan PUD and OCEC share maintenance of the distribution system. Both utilities maintain some percentage of underground lines in the Methow Valley. The OCEC has reported that 95% of new distribution line construction and feeder upgrades in their service area are being installed underground. There is also a growing number of residents living off the power grid by creating their own power source via solar, wind, or generators.

Some of the long standing irrigation ditches in the Twisp-Carlton Neighborhood have recently been shut down. Where an artificial riparian zone has been present for the last 80 years, there are now rows of dead or slowing dying trees and shrubs. These areas of formerly highly productive vegetation have become dry and prime for an ignition.

#### **4.7.5.1.4 Fire Protection**

Okanogan County Fire District #6 is responsible for structural and wildland fire protection within most of the populated areas of the Winthrop and Twisp-Carlton Neighborhoods. Okanogan County Fire Protection District #15 provides protection for the populated areas bordering the Methow River through the Lower Methow Neighborhood.

All of the Okanogan County fire districts have signed a "Memorandum of Understanding" to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on state and private lands based on a reciprocal agreement with the DNR.

#### **4.7.5.1.5 Community Assessment**

The Winthrop Neighborhood has a moderate risk of experiencing a large wildland fire due to the extensive development and conversion of the native fuels to pasture or other agricultural use. There is; however, a high potential for an ignition from various sources as a result of the density of recreation or other human activities. Recreational activities along the Methow and Chewuch Rivers and at Pearygin Lake State Park have a high likelihood of an ignition from campfires, BBQs, ATVs, etc. Careful maintenance of the fuels within and surrounding the park reduces this potential risk and helps protect the park from fires spreading into the area from the surrounding area. In the event of a threatening fire, the town of Winthrop may be at high risk due to the use of wood building materials on many of the buildings. The plank board siding, wooden side walks, and wood shingled roofs would be very receptive to ignition from fire brands.

The Twisp-Carlton Neighborhood is at moderate to high risk of wildfires. The continuity of fuels along much of the Methow River Valley bottom are broken by large agricultural developments, which helps slow the spread of fire. Most of the fire risk in this neighborhood occurs on the mid and upper slopes and in the developed drainages. Libby Creek and Texas Creek were identified in the Methow Community Wildfire Protection Plan as potential “hot spots” for fire activity. Economic values, fuel types, fire history, and access issues led to this designation. The riparian fuels along the river banks may also support a wildfire later in the summer as the water level goes down and the thick grass and brush begins to dry out. Fire spread along the waterway has the potential to threaten many homes as several structures are located along or near the water’s edge.

The Methow River Valley through the Lower Methow Neighborhood has a moderate risk of fire due to the extensive agricultural development. Nevertheless, there are several areas within this neighborhood that have a much higher fire risk. French Creek and Black Canyon Creek were identified as “hot spots” in the Methow Community Wildfire Protection Plan due to higher risk fuels, increased residential development, and access issues. Gold Creek, Squaw Creek, and

McFarland Creek are also at higher risk. Many of the homes in these drainages directly abut forest-type fuels and have limited access. Visible addressing on homes and driveways is also lacking in many of the more rural areas in this neighborhood.

The Alta Lake area including the State Park has a very high potential fire risk. Homes and recreational facilities were built very close together along the lake shore and lower slopes with forestland fuels intermingled and overhanging roofs. Wood siding, decking, and roofing are popular construction materials in this area as many of the structures are recreational or seasonal homes. The Alta Lake Road around the lake is fairly narrow with high risk fuels immediately abutting the travel surface. In addition, this is a dead end road with few areas large enough to turn fire suppression equipment around. The potential for an ignition in this area is very high due to the intensity of the recreational use. In the event of a fire in this area, there would likely be severe damage to many of the structures.

The Methow River Valley has been discovered as a prime recreational area and as such has experienced rapid subdivision development and scrutiny by developers. Many of the new homes going in are located in what used to be rural areas and are being built as vacation or seasonal use homes. In many cases, homes are being built in high fire risk areas with no precautions taken to reduce the wildfire threat around the home. Log homes are very popular and many homeowners are adamant about maintaining the trees and other “natural” landscaping on their property. This leads to several potential problems. Not only are these types of homes difficult and dangerous for firefighters to protect in a wildfire situation, but they also require additional suppression resources that could be used more effectively elsewhere to help stop the spread of the fire.

The growing number of residents living on their own power sources (off the grid) has allowed homes to extend further into the rural and backcountry areas of the County. Many of these homes are also not addressed, which makes them difficult to locate in emergency situations. Furthermore, concern over protection of these homes is compounded by the lack of water availability as many of these homeowners rely on deep wells with limited recharge.

#### **4.7.5.1.6 Mitigation Activities**

The best possible mitigation activity for all residents in the Winthrop, Twisp-Carlton, and Lower Methow Neighborhoods is to construct and maintain a defensible space. In grass and sage dominated areas, this may include mowing and clearing grass and weeds away from structures. In forest areas, thinning undergrowth and pruning larger trees may also be necessary. Locating flammable items such as firewood and propane tanks away from structures will also help reduce their risk. Due to the proliferation of out-of-County homeowners, an in-depth educational outreach program may be necessary to convey wildfire prevention and mitigation information.

Many of the smaller drainages throughout these neighborhoods are accessed by one-way in, one-way out roads. Insuring that these roads will be safe for an evacuation is critical. Fuels should be thinned away from the road surface. This not only creates a safe access corridor, but it can also serve as a potential fuel break. Private driveways should also be addressed with visible signs and safely accessible for fire suppression equipment. Longer driveways should have turnouts for vehicles to pass each other and an area large enough for a fire truck to turn around at the home site.

In general, due to the dispersed nature of the electrical infrastructure, all of the existing above ground power lines are exposed to varying levels of fire risk. Vegetation clearing under rights-of-way, multi-agency coordination of thinning adjacent to power line easements, and public

education can help prevent this system from failure due wildfires as well prevent a potential ignition from these lines.

The Alta Lake State Park should be a high priority for fuels reduction and homeowner education. The slopes around the lake are in need of fuels reduction treatments to reduce the fire risk and trees and other vegetation around homes should be pruned or even evaluated for removal in some cases. Homeowners should be made aware that wood construction materials drastically increase the probability of ignition. Furthermore, due to the close proximity of homes and other structures, there is high possibility that one home burning could catch several others on fire. The Alta Lake Road should be either extended to form a loop around the lake or significantly widened to allow for a better and safer evacuation of residents and visitors in the area during any kind of emergency. Reducing the fuels along this road would also help protect people and structures by not only allowing for safer access, but could also serve as a fuel break.

The Methow Community Wildfire Protection Plan has been completed and approved (February 2006) for the Methow River Valley. Extensive local research and planning went into the development of this plan; therefore, specific recommendations outlined in that document should also be supported.

#### **4.7.5.2 Neighborhoods of Twisp River, Wolf Creek, Mazama, and Chewuch**

The Neighborhoods of Twisp River, Wolf Creek, Mazama, and Chewuch are located on the north end of the Methow River Valley. These areas are incurring increased levels of development, particular by seasonal or recreational landowners.

The Twisp River Neighborhood encompasses the homes and surrounding forestlands in the Twisp River drainage from the town of Twisp west almost to the Mystery Campground. Structures in this neighborhood are mostly limited to the narrow Twisp River canyon. Homeowners with parcels farther west than Poorman Creek are surrounded by the Okanogan National Forest. The Skyline Ranch Subdivision on Newby Ridge on the south side of the Twisp River contains many tightly spaced homes on a steep north facing slope.

The Wolf Creek Neighborhood lies just to the west of the town of Winthrop and includes the Pine Forest and Wolf Creek Subdivisions as well as the Sun Mountain Lodge. Many of the structures in this area are strictly recreational or seasonal homes with the owners typically from out of the Methow River Valley.

The Mazama Neighborhood is the farthest north in the Methow River Valley and includes the unincorporated community of Mazama as well as the Lost River and Edelweiss Subdivisions. This neighborhood contains many structures built by owners out of the area for recreation purposes or seasonal residences. Nearly all of the homes in this neighborhood are located within or very near the flat bottom of the Methow River Valley.

The Chewuch Neighborhood lies to the north of the town of Winthrop and includes the structures along both the east and west sides of the Chewuch River and structures located along Rendezvous Road and Cub Creek Road. Most of the residential development in this neighborhood has occurred near the Chewuch River corridor and Rendezvous Road; however, there are several homes and ranches scattered throughout the surrounding area and subdrainages as well.

##### **4.7.5.2.1 Fuels Assessment**

Fuels in the Twisp River Neighborhood consist primarily of moderate density ponderosa pine and Douglas-fir along the slopes and riparian vegetation including black cottonwoods and other



hardwoods along the river banks. These forest-type fuels are fairly consistent and commonly intermingle with structures. The fuels in this drainage would likely support a moderate to high intensity wildfire with frequent crowning, torching, and jackpotting where accumulations of fuels exist. In addition, the narrow canyon would likely funnel smoke and hot gases causing additional safety and suppression problems.

The lower slopes in the Wolf Creek Neighborhood are mostly vegetated by grass and sagebrush or have been converted to livestock pasture or other agricultural purpose. The mid and upper slopes are dominated by moderate density ponderosa pine and some Douglas-fir. Some of these forested areas have been thinned to reduce the fire risk around homes such as in the Pine Forest Subdivision and on some parcels along Wolf Creek Road. A fire in this neighborhood would likely spread very rapidly along the surface with occasional jackpotting and torching of individual or groups of trees. In areas where the timber has not been thinned or otherwise treated such as along the northern extent of Wolf Creek Road and along the western edge of the neighborhood, a fire would likely burn much more intensely with more frequent crowning and torching.

Fuels in the Mazama Neighborhood are typically ponderosa pine and Douglas-fir at varying densities. Some areas have received fuels reduction treatments while other areas are profoundly overstocked with heavy accumulations of small diameter stems, regeneration, and underbrush. A fire in this neighborhood would likely burn very intensely causing considerable tree mortality and damage to structures.

Fuels in the Chewuch Neighborhood consist primarily of grass and sagebrush fuels. Much of the native vegetation in this area has been converted to livestock pasture or other agricultural use. Riparian vegetation including large black cottonwoods and other hardwoods is present along the banks of the Chewuch River. Forestland fuels exist beyond the Okanogan National Forest boundary on the north end of the neighborhood and would likely support intense wildfires, especially on the north aspects of Cub Creek and Little Cub Creek. Ponderosa pine and Douglas-fir are the prominent overstory species in this area. Fires throughout the Chewuch Neighborhood would likely be low to moderate intensity surface fires that spread very rapidly, particularly upslope. The riparian corridor may burn more intensely due to the higher density of fuels.

#### **4.7.5.2.2 Ingress-Egress**

The Twisp River Road is the primary access route in the Twisp River Neighborhood. This is a partially paved route that starts out as a two-lane road, but becomes narrow and unpaved further up the canyon until it eventually dead ends at Roads End Campground. There are a few secondary roads that branch off of the Twisp River Road that loop back to State Route 153 or State Route 20. These include Forest Route 4300-300 and 43, which connect to the Libby Creek drainage to the south and Elbow Canyon Road, which heads north to Winthrop. These secondary roads are graveled routes. The road accessing the Skyline Ranch Subdivision is a one-way in, one-way out road with a very steep pitch that might be limiting for some fire suppression equipment.

The Pine Forest Subdivision in the Wolf Creek Neighborhood is accessed off of Elbow Canyon Road via Patterson Lake Road and Twin Lakes Road from the town of Winthrop. Elbow Canyon Road and the secondary roads through the development are well-maintained graveled routes. Patterson Lake Road is a paved, two-lane road that dead ends at the Sun Mountain Lodge. Homes in the Wolf Creek area are accessed via the Wolf Creek Road from the State Route 20 on the north end and from Twin Lakes Road on the south end. Wolf Creek Road is a paved route through the more heavily developed area on its southern extent; however, it

deteriorates to a 4x4 vehicle only dirt road for several miles before widening again about one mile south of its connection to State Route 20. The fuels along the unmaintained portion of Wolf Creek Road are relatively dense and overhang the travel surface in many places. This would not make a safe alternative escape route.

The Mazama Neighborhood has several access points. The actual town site of Mazama is reached by the Lost River Road from State Route 20 or from the south by the Goat Creek Road. These routes are paved, two-lane roads. The Lost River Subdivision is accessed by following the Lost River Road north from the Mazama town site. This is a paved, two-lane route bordered by forest fuels. The slope rising sharply from the east side of the Lost River Road is very steep and rocky. Large rocks or slides could occur on this slope, particularly in the area known as the Goat Wall. Since this is the sole access road for Lost River Subdivision residents, rocks rolling onto the road surface could potential block this escape route. The Edelweiss Subdivision is accessed by private graveled roads from Goat Creek Road, which is a paved, two-lane route. Several of the private roads through the subdivision are dead ends; however, the main roads form loops through the area.

The primary access corridors in the Chewuch Neighborhood are the West Chewuch Road along the western side of the Chewuch River and the Eastside Chewuch Road on the eastern side of the river. These are both paved, two-lane routes originating in Winthrop and eventually connecting to form a loop just before the National Forest boundary. Rendezvous Road is a gravel route that branches from the West Chewuch Road and accesses many homes. This road deteriorates to an unmaintained dirt surface about two miles in front of the National Forest boundary. Homes along this segment of the Rendezvous Road may be difficult to access with some fire suppression equipment. There are also numerous private drives throughout this Chewuch Neighborhood. Most of these are clearly addressed and accessible to fire suppression apparatus.

#### **4.7.5.2.3 Infrastructure**

Water is provided to the Edelweiss Subdivision by two wells and is pumped to two water tanks with 225,000 gallon total capacity. Standpipes are provided through the development, but only one standard fire hydrant exists on the east end. This is because the water lines are too small to handle standard fire hydrant flows. Underground lines provide electrical power through the Edelweiss development.

Water is provided to the Pine Forest Subdivision by four wells and is pumped to two water tanks with 60,000 gallon total capacity. Standpipes are provided throughout the development, but there are no standard fire hydrants. The water system is maintained by the Pine Forest Homeowner's Association and is currently being upgraded to provide for better fire protection. Underground lines provide power through the development.

The Lost River Subdivision currently has a community water system as well as standpoints.

All other residents in the Twisp River, Wolf Creek, Mazama, and Chewuch Neighborhoods rely on personal or multiple dwelling well systems.

Okanogan Public Utility District (PUD) and Okanogan Rural Electric Cooperative (OCEC) provide electrical service to the Methow Valley with the OCEC serving the Twisp River area, Winthrop-Chewuch, and Mazama and PUD serving the remainder of the valley. Most of the Methow Valley's electricity needs are presently served by a single transmission line, which starts in Okanogan at a substation and follows the route of State Route 20 over Loup Loup Pass to the Twisp substation in the town of Twisp. Okanogan PUD is responsible for maintaining the transmission line under an agreement between the two utilities and the Bonneville Power

Administration. Okanogan PUD is currently engaged in an environmental review process to determine whether to construct a second transmission line to serve the valley. This second route would either be located in the upland hills on the east side of the valley or along the valley floor adjacent to State Route 153. Additionally, the valley's residents are served by a network of distribution lines that connect the transmission line to homes and businesses. The Okanogan PUD and OCEC share maintenance of the distribution system. Both utilities maintain some percentage of underground lines in the Methow Valley. The OCEC has reported that 95% of new distribution line construction and feeder upgrades in their service area are being installed underground.

#### **4.7.5.2.4 Fire Protection**

Okanogan County Fire Protection District #6 provides structural and wildland fire protection to most of the populated areas within the Methow River Valley in the Mazama and Chewuch Neighborhoods. This department also provides protection to most of the homes in the Twisp River and Wolf Creek Neighborhoods. In addition, homeowners in the upper Rendezvous area communally operate an older fire truck with a water tank for additional protection.

All of the Okanogan County fire districts have signed a "Memorandum of Understanding" to assist any of the other districts in the County with fire suppression to the utmost of their abilities. There are several types of fire jurisdictions within Okanogan County:

1. Private lands paying a tax to a fire protection district only (single jurisdiction with both wildland and structural fire protection).
2. Private lands paying the Forest Patrol Assessment tax to DNR only (single jurisdiction – no structural fire protection)
3. Private lands paying both a tax to a fire protection district and the Forest Patrol Assessment tax (joint jurisdiction with both FPD & DNR)
4. Additionally there are private lands in Okanogan County not paying any fire taxes and, therefore, have NO fire protection coverage.

State lands are the sole responsibility of the Washington Department of Natural Resources (suppression & reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County fire protection districts and the WA DNR.

The DNR provides wildfire protection during the fire season between April and October with a varying degree of resources available in the early spring and late autumn months. The U.S. Forest Service seasonally responds to all wildland fires on their jurisdiction and may also respond to wildland fires on state and private lands based on a reciprocal agreement with the DNR.

#### **4.7.5.2.5 Community Assessment**

The Twisp River Neighborhood has a very high risk of experiencing a damaging wildfire. Not only are the fuels throughout this area conducive to fire, but there are many homes that lack any kind of defensible space and are exposed to these fuels. Additionally, the access into this area is very limited. In the event of a fire, the Elbow Canyon Road would likely be the only safe alternate evacuation route to the Twisp River Road. Homes in this neighborhood are often scattered along both sides of the river. In some cases, there are well constructed bridges accessing groups of the homes on the other side; however, there are also several unrated

bridges that may not support large fire suppression apparatus. Private driveways often lack any kind of visible addressing and are often very narrow with high risk fuels on both sides. Wildfires burning in this area may funnel smoke and hot gases up the Twisp River canyon, which may cause health problems and makes safe fire suppression very difficult and dangerous. Homes on the mid and upper slopes, such as those in the Skyline Ranch Subdivision have an increased fire risk due to the limited accessibility and the likelihood of up-canyon and upslope fire spread.

The Pine Forest Subdivision and many of the homes in the Wolf Creek area in the Wolf Creek Neighborhood have a high potential fire risk. Structures in these areas often intermix with the forest-type fuels. Fuels reduction projects on many lots have helped reduce the fire risk to individual homes, but pockets of untreated fuels could still threaten these communities. There are several loop roads within the Pine Forest Subdivision; however, there is only one outlet to Elbow Canyon Road. The Forest Service has granted access to an additional emergency-only escape route along National Forest land. Isolated homes surrounded by timber along the Wolf Creek Road also have limited access. Narrow private drives with high risk fuels directly abutting the travel surface are common in both of these areas. Steeply sloping driveways and other access roads can also limit fire response vehicles. Cured grasses and steep slopes surround the Sun Mountain Lodge. Although the structures associated with the Lodge are reasonably protected by groomed lawns, a fire would likely spread through the flashy fuels upslope very quickly.

Nearly all of the Mazama Neighborhood has a very high risk of experiencing a damaging wildfire. Homes along the Lost River Road and in the Lost River Subdivision are typically completely surrounded by thick stands of timber and underbrush. Very few structures have any kind of defensible space and those that do are not likely to be adequate. Canopy closure throughout this area has a high probability of carrying a running crown fire, which is very difficult to suppress. The Lost River Road is in need of fuels treatments in order to serve as a safe evacuation route, especially since this is the sole escape route. Visible addressing is almost non-existent on private driveways. It is highly probable that several homes in this area would be lost in the event of a wildfire.

The Edelweiss Subdivision in the Mazama Neighborhood is located on the east side of the Goat Creek Road near the Fawn Creek drainage. This area also has a high fire risk; however, fuels reduction projects have been completed on about 22% of the development. There are still pockets of dense timber and understory vegetation that could threaten the entire community. The slope this subdivision was built on is fairly steep in some areas and would promote the rapid spread of fire. There are several loop roads and spur roads throughout the subdivision, but only two outlets to Goat Creek Road. The more traveled roads are generally well-maintained, but a few of the less used routes are very rough and/or steep and may not support all types of vehicle travel. Many of the homes in this subdivision are recreational or seasonal and were constructed using wood siding, decking, and/or roofing, which increase their risk of ignition. Additional defensible space treatment, community defensible space treatments, and homeowner education is needed to reduce the risk of wildfire in this area.

The Chewuch Neighborhood has a moderate to high risk of experiencing a wildland fire. Fires in this area will most likely spread very quickly, particularly upslope, leaving homeowners very little time to prepare. Therefore, lawns should be kept clean and green around structures in order to serve as a permanent defensible space. Homes bordering the river corridor may have a slightly higher fire risk due to the potential for a more intensely burning fire to be carried in these denser fuels. Homes located in the forested areas near the northern extent of Rendezvous Road and Cub Creek Road also have a much higher fire risk. These homes are

typically surrounded by dense stands of forest fuels and may be difficult and unsafe to access due to poor road conditions.

#### **4.7.5.2.6 Mitigation Activities**

As with any other neighborhoods, the best possible defense for residents in the Twisp River, Wolf Creek, Mazama, and Chewuch Neighborhoods is the creation and maintenance of a defensible space around structures. In grassland areas, this may include mowing and cutting fuels away from structures. In forest areas, this may need to include thinning of overstocked stands, removing underbrush, pruning limbs on larger trees, and using more fire resistant landscaping techniques. Homeowners should also be aware that wood siding, decking, and roofing increase the risk for an ignition of the structure.

Improvement of rural address signage and access on private drives is needed throughout these neighborhoods, but particularly in the Twisp River drainage, along Lost River Road, along the upper extent of Rendezvous Road, in the French Creek drainage, and in several other of the smaller drainages throughout the valley. Additionally, unrated bridges in the Twisp River area and anywhere else they occur should be evaluated and signs posted. Homeowners should be aware that firefighters will not risk their lives or equipment to save a home that is unsafe.

Additional fuels reduction projects and homeowner education are needed in several individual subdivisions and housing clusters to improve the safety of all residents in these areas. Those currently at the highest risk in these neighborhoods include the Alta Lake area, Twisp River drainage, Pine Forest Subdivision, Wolf Creek area, Lost River Subdivision, Lost River Road area, and the Edelweiss Subdivision. Fuels reduction in the Lost River Subdivision, Lost River Road area, and the Edelweiss area may also help improve forest health by reducing stress on the trees due to overcrowded conditions. Other areas that are at moderate to high risk, but are not as densely populated include Libby Creek, French Creek, McFarland Creek Road, Gold Creek Road, Rendezvous area, Twin Lakes area, and the Chewuch River drainage.

Fuels reduction projects along access routes will help insure safe evacuations during wildfire situations. This is particularly important in areas that have only one-way in and one-way out such as residents on Lost River Road, Twisp River Road, and Alta Lake Road. Once this work has been completed, these roads may also be able to serve as fuel breaks to help with fire suppression efforts.

The homeowner's associations in the Pine Forest and Edelweiss Subdivisions are currently trying to fund the improvement of the water lines throughout these developments in order to support fire hydrants. These projects should be supported as they will significantly reduce the fire risk to structures in these areas.

Individual Community Wildfire Protection Plans have been drafted for the Pine Forest Subdivision, the Edelweiss Subdivision, and the Methow River Valley. Extensive local research and planning went into the development of these plans; therefore, specific recommendations outlined in these documents should also be supported.

## **4.8 Firefighting Resources and Capabilities**

Fire district personnel are often the first responders during emergencies. In addition to structure fire protection, they are called on during wildland fires, floods, landslides, and other events. There are many individuals in Okanogan County serving fire protection districts in various capacities. The following is a summary of the departments and their resources. A map of the Okanogan County Fire Districts is presented in Appendix I

The Firefighting Resources and Capabilities information provided in this section is a summary of information provided by the Fire Chiefs or Representatives of the Wildland Firefighting Agencies listed. Each organization completed a survey with written responses. Their answers to a variety of questions are summarized here. These synopses indicate their perceptions and information summaries.

#### **4.8.1 City of Okanogan Fire Department**

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E-Mail: fire41@northcascades.net  
Address: P.O. Box 956 Okanogan, WA 98840

**District Summary:** The City of Okanogan Fire Department covers approximately 3.2 square miles of commercial and residential area. The area is mostly valley floor with steep pitches of grass and sage brush hills to benches with residences. There are fire hydrants that cover 85% of the city at this time. There are 26 volunteers in the fire department with a paid Fire Chief. Volunteers cover both the City and Part of Fire District #3. The City of Okanogan Fire Dept. provides lease space to Okanogan County Fire District #3. The City of Okanogan was involved in a catastrophic wild fire in July of 2003 that destroyed 4 homes in the city and damaging some 30 more, the fire district also lost one home and had several damaged during this 350 acre fire that started within the city limits of Okanogan, the amount of total loss was estimated at \$2.555 million in loss and the estimated cost to fight the fire at \$350,000.00. With residential mixed in with the wildland fuels, steep slopes, erratic winds, and dry summers with interesting landscaping schemes make for an interesting wildland fire scenario.

#### **Priority Areas:**

**Residential Growth:** After little or no growth in the past the City of Okanogan is experiencing a moderate to heavy expansion, with several new annexations and developments. These areas were previously agricultural areas that have been subdivided into varying densities; the upper benches are R-1 designations with the valley floor being of denser R-3 zoning.

**Communications:** Dispatched by OCS dispatch on the Pitcher Mountain repeater on a VHF frequency of 154.415, we currently utilize Motorola pagers of varying age Minitor 2 thru 5 pagers. We currently maintain a back up dispatch system for emergency's when OCS dispatch has a system failure. Neither the repeater nor the base stations are narrow band capable at this time. Mobile radios are non narrow band capable and will need to be upgraded in the near future. Portable radios are all Narrow band capable and are only limited by the number of channels they have. We currently have 2 licensed tactical channels in the City of Okanogan for fire department use.

**Fire Fighting Vehicles:** The City of Okanogan Fire Dept. has maintains there two apparatus with a routine preventive maintenance program. We currently own two type one engines that are checked on a weekly basis, all equipment is physically inspected and operated. We have a fund established for future purchases of equipment that was established in the 1960's this fund has monies appropriated to it on a yearly basis and is invested, but has not kept up with the inflation rate of fire equipment.

**Burn Permit Regulations:** The City of Okanogan has a burn permit program that was established 1989 by City Ordinance #716. The Outdoor burning code has been changed throughout the years to stay in compliance with the Clean Air Act. Permits cost \$10.00 and are issued for one year, there is a period of no burning that starts on June 1 and

goes through September 30. Permits are for natural vegetation only, minimal pile size and conditions pertain to each individual permit, violation of any part of OMC 8.36 results in a citation of \$500.00.

**Effective Mitigation Strategies:** The Okanogan Fire Department has participated in several educational talks with local service organizations, with minimal participation from the general public. We have also conducted some lot burns or weed abatement training burns within the city but have never applied for a grant to do either fuel mitigation or educational materials.

**Education and Training:** The City of Okanogan Fire Department firefighters are trained to the firefighter one standard, IFSTA 4<sup>th</sup> edition, with opportunities to go outside the department for further education and more hands on training such as the Washington State Fire Service training center in North Bend. We currently have 100% participation in the wildland firefighter red card system with most personnel trained to firefighter 2 level. Very few volunteers have the time to participate in classes other than those provided by this station. The fire department meets every Wednesday evening for equipment check and training this generally lasts for 3 hrs.

**Cooperative Agreements:** We are part of the Okanogan County Mutual Aide Agreement.

**Current Resources:**

**Station #1: 235 Oak St. Okanogan WA.**

Table 4.20. City of Okanogan Fire Department Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
2004	Chevrolet	Suburban/Command/EMS	0	0
1991	Spartan/E-One	Type 1 Engine	750	1500
1983	Spartan/FMC	Type 1 Engine	750	1500

**Future Considerations:** The major obstacle that stands before the fire department today is the limited amount of room for expansion of the Okanogan Fire Station it has reached its capacity. The need for a much larger joint fire station with Okanogan County Fire District #3 would give the City and the district the area needed to increase equipment numbers. At some time in the future the need for a 100' aerial will become a necessity and the need for a brush engine to cover smaller brush fires in the city limits. Recruit and retention of volunteer fire fighters we currently have 26 volunteers but in reality need a number closer to 40 to provide response times under the NFPA standard of 8 minutes. The tax base doesn't currently provide the funding for paid staff to cover during periods of limited staffing generally during the day time. A facility for training that would provide more opportunities for more realistic training scenarios and classroom larger in size and setup for today's training aids. Continued expansion of the cities water system to areas of the city not currently covered by fire hydrants. There is about 15% of the city not served by the cities water system and fire hydrants. A dispatcher that is solely dedicated to fire and EMS dispatch at the OCS dispatch center.

**Needs:** Increase in recruitment of firefighters and retention of these firefighters. Increase the amount of funding to provide for future purchases of large equipment, such as a 100' ladder. Radio upgrades to narrow band compatible and more channel capacity radios. A larger and more efficient fire station to house all the equipment currently owned by the City and Fire District #3. A training burn tower facility with large modern classroom for more advanced hands on training in operations and tactics. Education grants for materials and staff to meet with the public and educate them in firewise building methods and landscaping to prevent catastrophic wild fire.

## 4.8.2 City of Omak Volunteer Fire Department

Chief: Kevin Bowling  
Telephone: (509) 826-0760  
e-Mail: fire51@omakcity.com  
Address: P.O. Box 72 Omak, WA 98841

**District Summary:** The Omak Fire Department is made up of a full time chief and 27 volunteers. The Department is responsible for mainly structure fire protection but are trained and respond to wildland fires within Okanogan County Fire District #3 and surrounding areas. The city covers 3.3 square miles and has one station centrally located at 16 North Ash Street in Omak.

### Priority Areas:

**Residential Growth:** Currently experiencing light to moderate growth.

**Communications:** Currently communications are good for the central valley locations. Still appears to be some troubles in outlying areas of the County.

**Firefighting Vehicles:** Good to excellent condition. The city has only structure-type engines, but are able to utilize district equipment when needed for wildland type incidents.

**Burn Permit Regulations:** Have a burn permit program that works very well inside the City of Omak.

**Effective Mitigation Strategies:** The Department works with property owners every year to keep grass and weeds down to a minimum as much as possible. Still have a few areas that could present a problem.

**Education and Training:** The Department trains for two hours every Thursday night. The Department also works with the schools (mainly the grade school levels) to do fire prevention. The Department keeps the public informed on fire related issues and hazards through the local news paper and city of Omak's monthly newsletter.

**Cooperative Agreements:** Have a mutual aid agreement with every fire department and district within Okanogan County. Also have agreements through fire district #3 with the BIA and DNR.

### Current Resources:

#### Station #1: City of Omak

Table 4.21. City of Omak Volunteer Fire Department Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1991	E-One	Pumper	500 gallon	1500 gpm
1994	E-One	55' Tele Squirt	500 Gallon	1500 gpm

#### Station #1: District equipment housed in the City fire station

Table 4.22. District Equipment Housed at City of Omak VFD.				
Year	Make	Model	Tank Capacity	Pump Capacity
1984	Chevrolet ¾ ton	Type 6 brush truck	300	480 gpm
1991	Ford 1 ton	Type 6 brush truck	300	480 gpm
1994	Ford L 9000	Tender	3000	500 gpm
1995	E-One	Pumper	1000	1500 gpm



**Future Considerations:** For many years there has been a high number of wildland related fires caused by careless outdoor burning in rural areas all over the County. The local volunteer fire chiefs do not have the authority to enforce the outdoor burning. The Department believes that if a County fire marshal were hired it would help to cut down on a lot of the wild fire threat through better public education and enforcement.

**Needs:** County Fire Marshal

### 4.8.3 Town of Conconully Fire Department

Chief: Guy Layton

Telephone: 509-826-2396

Address: PO Box 114

**District Summary:** The Town of Conconully is a small resort community 20 miles North West of Okanogan. The town has 200 full time residents, mostly retired. The Town borders National Forest, DNR, BLM and private lands. The Department has an MOU with Fire Dist. 9 to provide structure protection within a 5 mile radius. The Department also provides EMS, but do not transport.

#### Priority Areas:

**Residential Growth:** Conconully has had a moderate growth with new homes being built the last 5 years. Also Dist. 9 within our 5 mile limit has had new homes built.

**Communications:** The Department is dispatched through the OCS dispatch. Pagers do not work in our area due to the town resting in a hole between several mountains. Portable radios have limited use also. A repeater is needed to solve this issue. The Department does not have narrow band capabilities at this time.

**Fire Fighting Vehicles:** Conconully has 1- 2 wheel drive brush truck, 1-1959 pumper, 1-1984 pumper and 1- 1968 tender. All these vehicles are in fair condition.

**Burn Permit Regulations:** The town does have regulations on burning, but hard to enforce.

**Effective Mitigation Strategies:** The Department works with property owners in town to keep weeds and burnable materials cleaned up. Conconully still has a lot of trees and brush around the edge of town that could be considered a fire hazard.

**Education and Training:** The Conconully Department has two meetings a month with one set as training. Training has been done more often depending on training needs and weather.

**Cooperative Agreements:** Conconully is part of the Okanogan County Mutual Aide Agreement.

#### Current Resources:

Table 4.23. Town of Conconully Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1990	FORD	F350 4X2	200	45gpm
1984	FORD	F700	750	700gpm
1959	FORD	F600	500	500gpm
1968	GMC	C60 Tender	2000	No pump

**Future Considerations:** Conconully Fire Dept. needs to update the brush truck to a 4 wheel drive model. Conconully has NO municipal water system, their water source is the two lakes near town and the creek that runs down the middle of town, with all 3 freezing over during the winter months.

**Needs:** Conconully needs a repeater near town to solve communication issues. We need a new fire hall as the current hall will not house all of the fire vehicles, plus it was condemned in 1980 by the Okanogan Building Dept. Conconully needs a fire suppression system for a year round water source. Conconully Fire Dept. needs more members but this is a problem due to most residents being beyond the age of joining the dept. along with most working age folks can not afford the high price to drive a 40 mile round trip to work to get to the Omak-Okanogan area so they do not live in Conconully very long. The Department's fire vehicles are old and in need of some major repairs which the town can not afford. The Department needs a 4 wheel drive brush truck. The fire dept. budget for the last several years has been a total of \$10,000 which does not go far when maintaining vehicles, fire hall, PPE training etc. The Department needs more training but this is hard to do with every member working a 40 hour+ job a week. The town has tried to set aside funds to replace the equipment but this has not worked out very well as there is only about \$1,000 in this fund.

#### **4.8.4 Town of Winthrop Volunteer Fire Department**

Don Waller

Telephone: 509-996-2227

e-Mail:

Address: 223 Englar St Winthrop, WA 98862

##### **District Summary:**

Town of Winthrop is a community of approximately 350. Winthrop is a tourist oriented town with an old western theme. Almost all structures have wooden façades and wooden sidewalks in the business district. Winthrop's population increases during tourist season and on Holidays maybe as much as 3,000.

##### **Priority Areas:**

**Residential Growth:** Winthrop has not seen the growth that the surrounding area has. There has been some growth but it has been modest.

**Communications:** Winthrop Fire Dept. is dispatched through the County dispatch, which is located in Okanogan at the Sheriff communication center. The department has good communications with all area response agencies.

**Fire Fighting Vehicles:** The Department's budget is not sufficient to replace the vehicles as is needed. The age of the two vehicles the Department currently has is 20 years.

**Burn Permit Regulations:** The Department does not issue burn permits. There is a no burn time from April until October.

##### **Effective Mitigation Strategies:**

With little public education ongoing, the need for paid firefighters to take on these and other public safety issues is a priority.

##### **Education and Training:**

The Department uses IFSTA training materials as a base for training and take advantage of the State training facilities whenever possible. The Department also uses outside instructors as often as possible. There are 3 certified Instructor 1 trainers.

##### **Cooperative Agreements:**

Winthrop is part of the Countywide mutual aid agreement with all departments.

## Current Resources:

Table 4.24. Town of Winthrop Volunteer Fire Department Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1986	Ford/Grumman	Fire Cat	500gal	1250GPM
1986	Ford	Rescue		

## Future Considerations:

Retention and recruitment of volunteers is always a problem. Finding a way to better help volunteers spend less time is a high priority. Winthrop needs to look at funding for paid daytime firefighters.

## Needs:

Our pumper needs to be replaced to keep up with current standards. Winthrop provides vehicle extrication for the upper Methow Valley. Our rescue vehicle is 20yrs old and in need of replacement.

The station in Winthrop is over 50yrs old with several different additions. The apparatus area is very inadequate for the modern apparatus. The training facilities are also inadequate. The need for a new station is a high priority. A training tower is need in the area with Fire Dist. 6 and Twisp.

### 4.8.5 Okanogan County Fire District #1

Chief: Rod Noel:

e-Mail: [publicworks@nvinet.com](mailto:publicworks@nvinet.com)

Address: PO Box 2200  
1300 Ironwood St.  
Oroville, WA 98844

**District Summary:** Okanogan County Fire District #1 covers approximately 2.2 square miles (2 in district and 0.2 within city limits) along the Okanogan River valley in the Oroville area. We currently have 25 volunteer firefighters.

## Priority Areas:

**Residential Growth:** Lots of new growth around Lake Osoyoos, public awareness.

**Communications:** Improvement in a County wide communication plan

**Fire Fighting Vehicles:** New chassis to replace our army tankers, (tank & pumps are good)

**Education and Training:** Firefighter #1 & 2

**Cooperative Agreements:** "County Mutual Aid"

## Current Resources:

### Station #1:

Table 4.25. Okanogan County Fire District #1 Equipment List.

Year	Make	Model	Tank Capacity	Pump Capacity
1998	E-One	Pumper	750	750 gpm
1985	FMC	Pumper	500	1500 gpm
1975	American LaFrance	Pumper	500	1500 gpm

**Table 4.25. Okanogan County Fire District #1 Equipment List.**

Year	Make	Model	Tank Capacity	Pump Capacity
2002	Ford	F-450 (Brush)	375	250 gpm
2005	Ford	F-550 (Brush)	500	250 gpm
1971	Am General	6X6 Tender	2500	350 gpm

**Future Considerations:** County wide fire marshal

**Needs:** Localized training

#### **4.8.6 Okanogan County Fire District #2**

**Fire Chief:** John Aumick  
Telephone: 509-663-0546  
Address: PO Box 233  
Elmer City, WA 9999124

##### **District Summary:**

Includes an area approximately 1 mile wide beginning at the northern edge of the city of Coulee Dam and proceeding north approximately 6 miles. It includes the city of Elmer City and the unincorporated villages of Lone Pine, Koontzville, and Seaton's Grove. Two main roads traverse the district from Coulee Dam north. Rural residences are scattered along both State Route 155 and the Elmer City access road. Bureau of Reclamation land is located on the south and west sides of the district and Colville Tribal trust land is scattered throughout the area.

##### **Priority Areas**

###### ***Residential Growth:***

Population in the district has remained about the same for the past few years. The town of Elmer City is approximately 250 and the rest of the district is approximately 250.

###### ***Communications:***

We use the Okanogan County dispatch center located in the town of Okanogan.

- Radios - 5 mobile units and 8 handheld portable units

###### ***Firefighting Vehicles:***

- 2 Type 6 Brush Trucks
- 2 Type 1 Structure Trucks
- 1 Type 2 Tender

###### ***Burn Permit Regulations:***

Follow US BIA (Mt. Tolman Fire Center) restrictions and guidelines. Permits are required and issued at the Elmer City Hall.

##### **Effective Mitigation Strategies**

Use all resources and cooperators available in a safe manner.

##### **Education and Training**

Follow Washington State DNR wildland fire fighting guidelines. Use State, Federal, and local cooperator training resources.

## Cooperative Agreements

Contract with the city of Elmer City. Cooperative agreement with US BIA (Mt. Tolman). Mutual aid agreement with Town of Coulee Dam, Town of Grand Coulee, Town of Electric City, US Bureau of Reclamation, and Okanogan County.

## Current Resources

### Station #1 – Elmer City, Washington

**Table 4.26. Fire District #2 Station #1 Equipment List.**

Year	Make	Model	Tank Capacity	Pump Capacity
1984	GMC	7000	1000	1000
1986	Dodge	350	300	25
1976	GMC	6000	1000	450
1976	White	9000	3000	250
1990	Ford	350	200	75

### Future Considerations:

There is a current active effort to annex the villages of Belvedere to the north and McGinnis Lake to the east. This will effectively more than double the size of our district.

### Needs:

Difficult time maintaining a volunteer firefighting work force. People don't volunteer anymore. Our main need is a new fire station that can house all of our equipment and gear.

## 4.8.7 Okanogan County Fire District #3

Chief: Station 1, Kevin Bowling; Station 2, Gordon Hennigs; Station 3, Mike Hinger  
Telephone: 509-826-0760; 509-422-5757; 509-422-4161  
e-Mail: [fire51@omakcity.com](mailto:fire51@omakcity.com); [fire41@northcascades.net](mailto:fire41@northcascades.net); [fire31@ncidata.com](mailto:fire31@ncidata.com);  
Address: P.O Box 1045, Okanogan WA 98840

**District Summary:** Okanogan County Fire District #3 consists of 71 square miles, the population of about 8,000 with an assessed value of \$213,619,646.00. The area is predominately valley floor with steep slopes to benches, residences are located at the edge of these benches with very little regard to the wildland fuel that abuts there residence. Fuel types are natural grasses and sage, some areas have sage as tall as 16' in height. There are 3 stations within the fire district, Station one is located in downtown Omak WA, the fire district rents space from the City of Omak, Station two is located in downtown Okanogan WA this station is located approximately 6 miles from the Omak Station, the fire district rents space from the City of Okanogan and Station three is located in Malott WA a non incorporated community 10 miles south of Okanogan. There are about 78 volunteer fire fighters in fire district #3, each station maintains its own roster and handles its own recruitment. There are three Commissioners of the fire district, Chair Joel Hand, Commissioner Rod Rumbloz, and Commissioner Dave Stevens. They have monthly meetings located at the Okanogan Station training room on the second Tuesday of the month. The area was heavy towards agriculture until recent years were the loss of orchard ground has provided large tracts of land that provide avenues for fire to enter the district or leave the district whatever the case maybe. The fire district responds to structural fire, EMS major medical calls and rescue, wildland fire, hazardous material calls non operational and water rescue. The fire district in 2005 responded to 429 calls and had a loss amount of \$1,144,900.00.

## Priority Areas:

**Residential Growth:** The fire district has seen moderate growth over the last several years. The loss of agriculture ground due to the down turn in the apple industry has provided for the opportunity to sub divide property into building lots.

**Communications:** The fire district has ownership of licensed VHF non narrow band repeater, the sight is located on Pitcher Mountain to the east of Okanogan, we are dispatched by the OCS dispatch center, and we currently have Motorola pagers of the Minitor 2, 3, 4 and 5 age groups. Portable radios are of several different makes and models Bendix King Model GPH, Motorola HT 1000, HT 1250 and some RELM RPV 3600 radios these are all narrow band capable. Mobile radios are Motorola radios GM300 16 channel radios these are not narrow band capable radios, this and the repeater would be the weakest link in are radio communications system. We currently have a written agreement with WADNR and the USFS for the use of there radio frequencies.

**Fire Fighting Vehicles:** We have 6, type 6 engines, 4, type 1 engines and 3, type 2 tenders, these are all in operational. The oldest of the fleet in engines is a 1976 Mack and the newest of the engines is a 2004 Spartan/Rosenbauer, are oldest type 6 are 2 1983 Chevrolet 1 tons, and the newest are 2 1992 Ford F350.

**Burn Permit Regulations:** there are no burn permits within fire district #3

**Effective Mitigation Strategies:** There has been very little mitigation strategies used within fire district 3 we have participated with the local DNR in some educational classes in defensible space through the years.

**Education and Training:** All fire fighters are supposed to be trained to the fire fighter one standard with wildland fire fighting optional for each station about 2/3rds of the fire district has red cards. They are currently trained to the identification level of Hazardous Material training.

**Cooperative Agreements:** Okanogan County Fire District #3 currently participates in the Okanogan County mutual aide agreement, we have agreements with the WADNR, BIA Colville agency, As well as special contracts with the Colville tribe for protection of Paschal Sherman school, Numerous HUD housing projects, and two lumber mills.

## Current Resources:

### Station #1: Omak Station 1; 16 N Ash St. Omak FD#3 North

Table 4.27. Fire District #3 Station #1 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1995	E-One	Type 1 Engine	1000	1500
1997	Ford	Lt 9000 Tender type 2	3000	500
1992	Ford	F350 4X4 Type 6 Engine	300	120
1983	Chevrolet	K30 4X4 Type 6 Engine	300	120

### Station #2: Okanogan Station 2; 235 Oak St. Okanogan FD#3 Central

Table 4.28. Fire District #3 Station #2 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
2004	Spartan/Rosenbauer	Type 1 Engine	750	1500
1986	Ford	LT 9000 Tender type 2	2500	400
1991	GMC	K3500 4X4 Type 6	200	100

Table 4.28. Fire District #3 Station #2 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1986	Chevrolet	K30 4X4 Type 6	300	120

**Station #3: Malott Station 3; 3 Columbia St. Malott FD#3 South**

Table 4.29. Fire District #3 Station #3 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1996	E-One	Type 1 Engine	1000	1250
1976	Mack	Type 1 Engine	800	1250
1986	Peterbuilt	Tender Type 2	4000	250
1992	Ford	F350 4X4 Type 6 Engine	300	120
1983	Chevrolet	K30 4X4 Type 6 Engine	300	120

**Future Considerations:** The need for small one engine stations on the out skirts of the district that are outside the 5 mile insurance radius, we currently have 3 areas in the district that are beyond the 5 mile requirement. The three stations are at capacity at this time and would need to have additions or a new station built to provide adequate protection to equipment. The Okanogan Station currently has one type 6 engine that is parked outdoors during the summer months and stored outside during the winter off sight. If the City of Okanogan were to purchase another piece of equipment this would force another piece of the districts equipment out the door. The possibility of a larger station built in conjunction with each other. Update Radio system to narrow band with increased radio channels on all mobile radios, add base station console to each station for dispatch during heavy volumes of traffic at County. The need for a back up generator at all three stations to make them more self sufficient during times without power. Increased training and advancement in the red card system being volunteers they spend between 3 and 10 hours per week already training and going to calls. The possibility to add a paid daytime shift to help supplement the volunteers, recruit and retention of volunteers.

**Needs:** Radio upgrade to narrow band capable radios with more channel capacity. Upgrade fire station in Okanogan and Omak or an addition to existing facilities for storage of district equipment and (3) small single engine stations and the purchase of (3) type 4 engines for the outlying areas to cover areas outside the 5 mile radius of the current stations. Fuels reduction grants in the areas in and around the fire district such as the Buzzard Lake, spring coulee, and Chilliwiist and Salmon Creek drainages. Education grants for the areas inside the district were fuel types are non timber related but more towards the sage and grass fuel types. Education grants for firefighters continuing education in wildland firefighting and hazardous materials. An Okanogan County Fire Marshals Office and staff to administer the fire code for permitting and inspections of commercial buildings in the County.

#### **4.8.8 Okanogan County Fire District #4**

**Fire Chief:** Don Johnson  
Telephone: 509-436-2611  
Address: PO Box 1395  
Tonasket, WA 98855

**District Summary:**

Our district covers 174 square miles and about 6,000 people with homes valuing about \$97,788,806. Mostly rural, residential, and farms/agriculture. Our district includes the



incorporated city of Tonasket and the unincorporated communities of Ellisforde and Crumbacher as well as a municipal airport. Okanogan County Fire Protection District #4 is 100% volunteer.

### **Priority Areas**

**Residential Growth:** Surrounding districts growing substantially. Our growth is moderate to slow.

**Communications:** We dispatch via radio/pager through Okanogan County Sheriff 911. Interoperable with other districts and agencies (DNR, USFS, etc.).

**Burn Permit Regulations:** Done through district – DNR issues permits.

### **Effective Mitigation Strategies**

County-wide burn ban coincides with DNR/USFS burn ban/restrictions, free safety education through school, and Firewise program.

### **Education and Training**

Mostly in-house. Red Card, First Aid, 4 First Responders, 4 EMTs, NIMS, WMD, Burn to Learn, Search & Rescue at Academy, Firefighter Essentials, and HazMat – recognize and identify.

### **Cooperative Agreements**

County-wide mutual aid, wildland response agreement with DNR.

### **Current Resources**

#### **Station #1 – Tonasket, Washington**

**Table 4.30. Fire District #4 Equipment List.**

<b>Year</b>	<b>Make</b>	<b>Model</b>	<b>Tank Capacity</b>	<b>Pump Capacity</b>
1994	Peterbilt	Tender	3800	1000+
1996	Kenworth	W900 A Tender	2500	1000
2000	Ford 4x4	F550 Crash/Rescue	500	200 with Foam
2002	Ford 4x4	F450 Brush	300	200 with Foam
2004	Ford 4x4	F550 Brush	500	350 with Foam
1982	GMC/FMC	Structure	1000	1000
1988	Ford/FMC	Structure	1000	1250
1973	Seagraves	Structure	500	1500
1988	Chevy 4x4	Utility	N/A	N/A

### **Future Considerations:**

Possibly a satellite station or two near more populated areas such as Crumbacher.

### **Needs:**

Thermal Imager, new PPEs (structural and wildland), new SCBAs, and update structural engine.

## **4.8.9 Okanogan County Fire District #6**

Chief: Donald R Waller

Telephone: 509-997-2981

e-Mail: fire6@mymethow.com

Address: PO Box 895 Winthrop, WA 98862



**District Summary:** Fire District #6 is the largest Fire District in the County by area covering approximately 350 sq.mi. The District has four stations in the main communities of Mazama, Winthrop, Twisp and Carlton, located along the Methow River running through the Methow Valley. It is an all volunteer department except for a full time Chief. It's top priority is structure protection, but the district also has wildfire equipment. District lands have a dual jurisdiction with the WA DNR which results in a good working relationship. Also much of the District borders National Forest and again cooperation with the different agencies is excellent. Mutual aid agreements with other Fire Districts are in place. The District includes a wide variety of fuel types ranging from grassland to heavy timber and everything in between.

#### **Priority Areas:**

**Residential Growth:** Fire Dist. 6 has the highest rate of new construction in Okanogan County. Most of the Construction is residential in the urban interface areas. Urban interface area is the biggest concern.

**Communications:** Dist. 6 has a good communication system throughout the Dist. except for Lost River area which should be in operation in July of 2006.

**Fire Fighting Vehicles:** Effective Mitigation Strategies: Dist. 6 largely has a good fleet of vehicles. Wildland engines are the highest priority at this time. We need at least two type 3 or 4 engines to deal with the interface problem. Dist. Commissioners have a replacement schedule for equipment, but they are finding it more difficult to keep on schedule given the combination of inflation and tax limitations in the State of Washington

**Burn Permit Regulations:** Dist. 6 does not issue burning permits. When fire danger is high, a complete burn ban is instigated.

**Other:** The highest priority now is hiring 3 people to cover daytime response during weekdays. As an all-volunteer department personnel response is sometimes only 1 or 2 volunteers during this time period. The additional staff could also provide public education, which is almost non-existent and could spend more time training new volunteers and maintaining current volunteers.

**Education and Training:** The Dist. has a continuing training program and trains its volunteers as structure, vehicle rescue and wildland and other hazards.

**Cooperative Agreements:** The District has mutual aid agreements Countywide. Fire District State Mobilization is also available. The District also has excellent working relationships with WA DNR and USFS.

#### **Current Resources:**

##### **Station 1: Mazama**

Table 4.31. Fire District #6 Station #1 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
2004	Central States	Pumper	1000 gal	1500 GPM
1996	Kenworth	Tender	3000 gal	300 GPM
1991	Ford 450 4x4	Wildland	450 gal	100 GPM

##### **Station #2: Winthrop**

Table 4.32. Fire District #6 Station #2 Equipment List.				
Make	Model	Model	Tank Capacity	Pump Capacity
1996	Central States	Pumper	2000 gal	1500 GPM

Table 4.32. Fire District #6 Station #2 Equipment List.				
Make	Model	Model	Tank Capacity	Pump Capacity
2006	Central States	Tender	3000 gal	750 GPM
1991	Ford 450 4x4	Wildland	450 gal	100 GPM
1989	Ford 350	Rescue	N/A	N/A

### Station #3: Twisp

Table 4.33. Fire District #6 Station #3 Equipment List.				
Make	Model	Model	Tank Capacity	Pump Capacity
2004	Central States	Pumper	2000 gal	1500 GPM
1989	Kenworth	Tender	4000 gal	300 GPM
1991	Ford 450 4x4	Wildland	450 gal	100 GPM

### Station #4: Carlton

Table 4.34. Fire District #6 Station #4 Equipment List.				
Make	Model	Model	Tank Capacity	Pump Capacity
1996	Central States	Pumper	2000 gal	1500 GPM
1996	Kenworth	Tender	3000 gal	300 GPM
1990	Ford 450 4x4	Wildland	450 gal	100 GPM

**Needs:** The Winthrop Station is inadequate to handle the equipment and training needs. Replacement of the station is a high priority.

## 4.8.10 Okanogan County Fire District #7

Chief: Brad Armstrong  
 Telephone: 509-322-2463  
 e-Mail: [bearmstrong408@hotmail.com](mailto:bearmstrong408@hotmail.com)  
 Address: 107 Edwards Street / P.O. Box 233  
 Riverside, Washington 98849

**District Summary:** The District covers 33 square miles of mainly farmland and state highway 97. There is currently some DNR land within the District and there may be more if a proposed annexation (Tunk Mountain area) goes through on the November ballot. A new fire brigade will be formed if this does happen to go through.

### Priority Areas:

**Residential Growth:** The District has a significant growth area. The District has recently found out that they will have many new subdivisions going in and have had two more businesses move into the area within the last year. The pending Tunk Mountain annexation will introduce several new developments as well.

**Communications:** Currently, the District has the Tunk and Lemenasky Repeaters and County Fire. Station communications are good due to new portable and mobile radios from the American Firefighters grant in 2006.

**Fire Fighting Vehicles:** 2 Brush vehicles, 2 structure engines, and 1 aid vehicle

**Burn Permit Regulations:** None at this time.

**Effective Mitigation Strategies:** No planned PCT work, no brush clearing planned anytime soon.

**Education and Training:** Wildland, structural, motor vehicle accident, and ICS training.

**Cooperative Agreements:** Okanogan County Mutual Aid Agreement. Respond to DNR land when toned, but mainly requested.

**Current Resources:**

**Station #1:** 101 1st Street, Riverside, Washington

Table 4.35. Okanogan County Fire District #7 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1997	Ford	D/EX 350	0	0
1988	Chevy	Custom Deluxe	300	
1975	Mack	Pumper	500	1500
1972	Ford	Pumper	500	750
1985	Chevy	Brush Truck	250	

**Future Considerations:** Growth rate in the last two years has gone up considerably. There is a high likelihood of several new subdivisions being built in the near future, many of which will have little access to water.

**Needs:** New vehicles, station, washer, dryer, hose dryer, hose washer, water tender, and a considerable amount of basic life support equipment.

#### 4.8.11 Okanogan County Fire District #9

Chief: Tyson Woodward  
Telephone: 1-509-422-3642  
e-Mail: tysonw@amerion.com  
Address: 1131 Salmon Creek Road  
Okanogan Wa. 98840

**District Summary:** District 9 is about 64 square miles. It is made up of farms, ranches and open range lands. Structures are fairly scattered in most parts. The District does surround the community of Conconully that has about 40 full and part time residents that reside within Dist. 9. District 9 only has Wild land fire equipment we rely on Conconully for structure protection with in 5 miles of there town. We also have a mutual aid agreement with dist. 3 for structure protection. District 9 borders USFS, BLM, DNR, and Washington Fish and Wildlife. District 9 is part of the County wide mutual aid agreement.

##### **Priority Areas:**

**Residential Growth:** District 9 has had a small amount of growth with new housing being built in the last 5 years.

**Communications:** District 9 is dispatched by OCS dispatch.

**Fire Fighting Vehicles:** District 9 has 6- 4x4 brush trucks 1- 1986 6x6 water tender 1- 1978 4x4 500gpm pumper.

**Burn Permit Regulations:** District 9 is under Okanogan County burn regulations.

**Effective Mitigation Strategies:** Most residents keep weeds and tall grasses mowed around there structures.

**Education and Training:** Wild land training is conducted once a month depending on weather and more often when needed.

**Cooperative Agreements:** District 9 is part of the Okanogan County Mutual Aide Agreement.

**Current Resources:**

**Station #1:**

Table 4.36. Okanogan County Fire District #9, Station #1 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1978	Chevrolet	6500 4x4	500	500
1986	American General	6x6	1500	50
1982	Ford	F350	250	40
1968	Dodge	300 4x4	250	20
1982	Chevrolet	2500 4x4	200	20

**Station #2:**

Table 4.37. Okanogan County Fire District #9, Station #2 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1982	Chevrolet	2500 4x4	200	20
1982	Chevrolet	2500 4x4	200	20
1983	Chevrolet	2500 4x4	200	20

**Future Considerations:** District 9 needs a 3000 gallon water tender, two newer brush trucks and a larger and more modern pumper.

**Needs:** District 9 needs to get a repeater, radio communications are very poor. We need a fire hall in the winter we drain our trucks and store them in a barn owned by Washington Fish and Wild Life. The barn has a heated room big enough for our water tender and one brush truck. We have a budget of about \$13,000.00 a year and it is tough to maintain our aging equipment. We need more training but it's tough to do when all our members work 40 or more hours a week.

## **4.8.12 Okanogan County Fire District #11**

### **Board of Commissioners**

Jean Vernon, Chairman	485-3060	Glen Richardson	485-3253
Steve Leslie	485-3941	Carmen Kinley, Secretary	485-1902
Fields station phone	485-2131		

### **Okanogan County FPD #11 Fire Division Command Officers**

Fire 181 Phil Dart,	Fire Chief	485-3533
Fire 181A Harry Leslie	Captain	485-3041
Fire 181B Steve Kinley	Captain	485-1902
Fire 181C Denny Bale	Lieutenant	485-2201
Fire 181D Rodney Field	Lieutenant	485-3500

**Location:** North Central Okanogan County

**Size:** 71,040 private acres (111 square miles).

**Serving:** approximately 550 citizens with an estimated 350 structures.

**Tax Revenue:** 2005 (estimated) - \$30,000

**Assessed value real property:** \$ 31,000,000

**Topography:** Mountainous with numerous drainages.

**Demographics:** Unchecked development with urban interface neighborhoods. 20-acre parcels surrounded by large and small ranches. Isolated mountain homes and cabins. Approximately 70% of land in North Central Okanogan County is under the governmental management of the USFS, Washington State Department of Natural Resources, Washington State Department of Fish and Wildlife and the Bureau of Indian Affairs.

**Strategic Layout:** OKCOFPD #11 has one centrally located station (Fields Hall) and two 'satellite' stations located in the communities of Molson and Chesaw.

**FPD #11 Operations:** OKCOFPD #11 has a Chief, two Captains and two Lieutenants.

**FPD #11 Apparatus:** 1- type 3 engine, 5- type 6 engines, 4- tenders, 1- structure engine

#### **OKCOFPD #11 District Equipment List for Fire Protection**

Table 4.38. Okanogan County Fire District #11 Equipment List.				
Assigned Station	Make/Model	Tank Capacity (gal)	Pump Capacity (gpm)	Type
Molson E-184A	1978 Dodge 4x4	300	120	Wildland T6
Molson E-188A	1957 Ford 2x2	750	1500	Structural
Fields E-184B	1985 Dodge 4x4	300	120	Wildland T6
Fields E-184 D	1981 Chevrolet 4x4	300	300	Wildland T6
Fields E-183B	1967 Ford 4x4	1200	120	Wildland T3
Chesaw E-184C	1985 Chevrolet 4x4	300	120	Wildland T6
Chesaw E-188B	1982 Chevrolet 4x4	500	1000	Wildland T3

#### **Summer Resources:**

183B 1972, Kenworth 4000 gallon tender / 184E 1981 Chevrolet 4x4 Wildland T6 183C Military 6x6 1200 gallon tender/183D Military 6x6 1200 gallon tender

**FPD #11 Staffing:** 42 volunteers, a Chief and 4 officers make up OKCOFPD # 11. An elected three-member Board of Commissioners governs the District. There is also a Fire Association.

**Fire Training Level:** All firefighters are currently scheduled or trained as basic structural firefighters. In addition all firefighters are scheduled or trained as wildland firefighters (red carded). The majority of the red carded members are also Firefighter type 1 rated. One officer is certified as Incident Commander type 4, Single Resource Boss, Dozer Boss and Engine Boss.

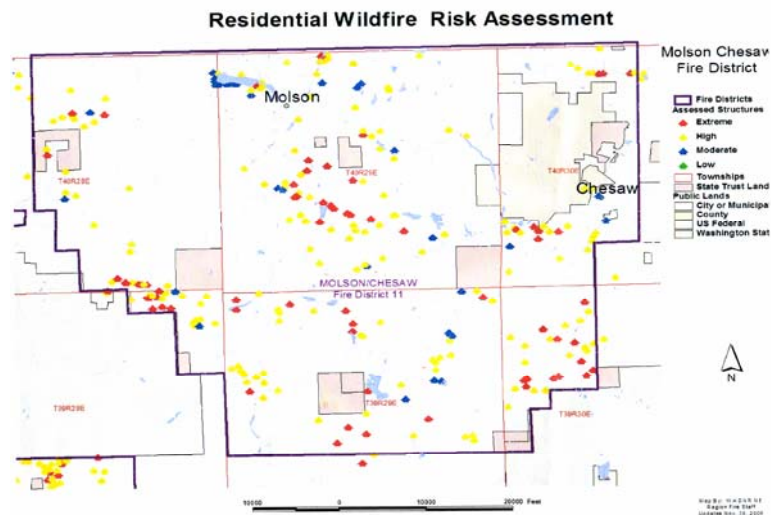
**Responses:** Average of 23 responses (wildland and structural) (Two recent project fires Wilcox and Nine Mile). Nearly 1/2 of all responses are in conjunction with the WA DNR (cooperative agreement).

**Mutual-aid:** Formal Mutual-aid agreements exist between OKCOFPD #11 and all other Okanogan County Fire Protection Districts, the WA DNR and the USFS. Between 2000 and 2004 OKCO FPD #11 responded to 21 calls for assistance from Washington State DNR.

**Inter-agency suppression:** OKCOFPD #11 is a founding member of NE-WA-CO (Northeast Washington Coalition of fire suppression agencies). 1 of the 5 initial attack engines is non taxed based allowing OKCOFPD #11 a history of responding to mobilization calls outside jurisdictional boundaries; some examples of which are 1995 Mt. Anne, 1999 Lemansky, 2000 Rocky Hull, 2001 Pickens, 2003 Eagle Rock, 2003 Highland Complex and 2004 Sourdough. Additionally numerous minor responses have occurred supporting the WA DNR during lightning bust ignitions.

**Inter-agency participation:** OKCOFPD #11 is active on a regional basis with members serving on various committees and organizations i.e.; NE-WA-CO, Fire Chiefs Association, Prescribed Fire Council and the Highlands Fire Defense local coordinating group.

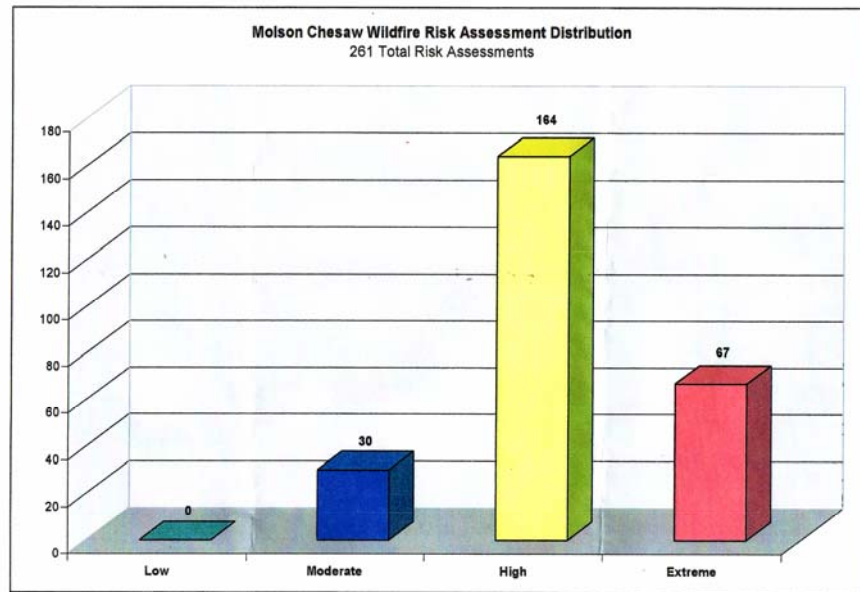
**Jurisdiction boundaries:** Northern boundary is 13 miles of east/west international border with the closest Canadian fire station being 20 miles from our Molson satellite station. Western boundary follows Nine Mile road adjoining private ground. Eastern boundary is the Chesaw highway and adjoins private and USFS property. The Southern boundary is intermixed with USFS and private property. OKCOFPD #11 adjoins approximately 300,000 acres of land not protected by any FPD.



**Wildland fuel composition:** A fire-adapted ecosystem of dry site ponderosa pine, Douglas fir and associated vegetation. Historically, the fire regime was frequent, low-severity wildfires. Successful fire suppression, coupled with the various land management practices have led to overstocking of small trees (dog hair thickets) and an excess of surface debris and brush. This overstocking of vegetation and buildup of surface fuels has led to conditions with high potential to result in frequent moderate to high-severity wildfires. These fires come with an elevated potential for negative effects to our communities.

**Fire ignitions & Risk Assessment:** The area, which comprises OKCOFOD #11, is fire prone with a high frequency of lightning ignitions in June, July, August and September. Additionally there are frequent human fire starts throughout the region. The WA DNR Urban Interface Risk Assessment program has completed 261 NFPA 299 risk assessments within the jurisdictional boundaries of OKCOFPD#11. The assessments find 0 residences with low fire danger, 30 residences with moderate fire danger, 164 residences with high fire danger and 67 residences with extreme fire danger.





## OKANOGAN COUNTY FPD #11 NEEDS ASSESSMENT

**Fire Training:** While only one member is certified in a line rated position for wildland fire, we have many long term members who have skills, knowledge and abilities as Resource Boss, Strike Team Leader and other advanced levels. The majority of OKCOFPD #11 members are red carded and the majority of those are FFT1 rated. The primary obstacle for obtaining more training is the unpaid time commitments for the several weeks of required training at the ISC 230, 231 & 232 plus ISC 290 and leadership courses. At present OKCOFPD #11 performs a very limited rescue service due to lack of equipment and training. The proposed Kinross mine operation at Buckhorn Mt. is going to greatly increase the training demands on OKCOFPD #11. OKCOFPD #11 is not trained in the use of SCBA equipment due to lack of training and equipment. OKCOFPD #11 also needs a live fire training facility, to facilitate training opportunities for district members.

**Fire Response Apparatus:** An aging fleet of apparatus is our primary limitation. The newest vehicle of our fleet is a 1985 type 6 engine while the oldest is a 1957 structure engine. OKCOFPD #11 needs to update the entire fleet. The initial response engines will need to be equipped with rescue gear as well as fire gear to handle the increased heavy equipment traffic caused by the mining operation, the increased population supporting the mine and the associated mining support services.

**Fire Stations:** While the primary station in the district (Fields Hall) is located centrally in the district and is a relatively new (1999) 3 bay facility the district still needs the additional development of stations. The 2 bay 2 apparatus station in Molson and the 2 bay 2 apparatus station in Chesaw are much less than adequate for current needs. Stations similar to Fields Hall need to be built on the Southern and Western boundaries of the district. The Molson and Chesaw stations need to be expanded.

**Communication:** OKCOFPD #11 is not tied into the county 911 response system. Although we have installed a repeater we still lack the equipment ie: software and radio based pagers to integrate into the county system. At present we are dispatched via landline telephone. There is no cell service in the district.

**Personal Equipment:** OKCOFPD #11 is severely lacking in personal equipment. At present no members have certified turnout gear. What turnout gear the district does have is 1980's vintage. 80% of the members have wildland gear but increased demands on the district will leave us short in the very near future.

**Fuels Reduction:** Approximately 30,000 acres of OKCOFPD #11 is privately managed timber in need of fuels reduction caused by numerous developments with poor forest practice planning ie: extensive ladder fuels from developments, doghair thickets and logging slash. This greatly increases the risk of a severe wildfire event in OKCOFPD #11 either from a lightning strike or human caused fire.

#### 4.8.13 Okanogan County Fire District #12

##### BOARD OF COMMISSIONERS

Patty Ekenes, Chairman 556-2015  
 Bob Mann 556-2000  
 Bruce Bews 556-2020  
 FPD #12 Fire station 556-2911 fax 556-2912

##### FPD #12 Officers

Mark Vine, Fire Chief #170 556-2509  
 Judy Daharsh, Safety Officer #174 556-2189

**Location:** North Okanogan County of Washington State

**Size:** 9,702 private acres (14.7 square miles)

**Serving:** approximately 1,100 citizens with an estimated 400 structures

**Tax Revenue:** 2006 estimated total \$10,000

**Assessed value real property:** \$14,185,573

**Topography:** Mountainous with rock bluffs, valleys, and many steep drainages.

**Demographics:** Unchecked development of interface neighborhoods in mountains and valleys. Mountain homes and cabins are served by primitive county road and primitive auxiliary roads and driveways.

All of Okanogan Fire District #12 is under governmental management by Washington Department of Natural Resources, Bureau of Indian Affairs, the Bureau of Land Management, and is adjacent to the National Forest.

**Strategic Layout:** Okanogan Fire District #12 has one fire station located on Swanson Mill Road approximately in the center of the district.

**FPD #12 Operations:** FPD #12 has one operation division primarily for the purpose of wildland fire suppression. Every firefighter is trained in current First Aid/CPR, but there are no qualified EMS personnel or equipment.

**FPD#12 Apparatus:** two initial attack fire engines and one type 3 tender are available year round. Additionally, six engines, two tenders, and a command car are available during fire season when freezing temperatures and snow are not a problem.

Table 4.39. Fire District #12 Equipment List.

Location	Assigned call sign	Year	Make/Model	Tank (Gal)	Pump (GPM)	Wildland Type
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**Table 4.39. Fire District #12 Equipment List.**

Location	Assigned call sign	Year	Make/Model	Tank (Gal)	Pump (GPM)	Wildland Type
Station	174A 12-11	1995	Ford F350 4x4	310	100	6 Engine
Station	173A 12-7	1986	Military 6x6 2-1/2 T	2,000	250	3 Tender
Station	174B 12-10	1986	Chev. Military P.U. 4x4	250	100	6 Engine
Seasonal	1 12-0	1986	Chev. Mil. Blazer 4x4			
Seasonal	174C 12-1	1985	Chev. Mil. P.U. 4x4	350	100	6 Engine
Seasonal	174F 12-2	1986	Chev. Mil. P.U. 4x4	250	50	6 Engine
Seasonal	174G 12-3	1983	Ford Mil. 6 Pass 4x4	350	50	6 Engine
Seasonal	173 C 12-4	1973	Mil. 6x6 2-1/2 T	1200	250	3 Tender
Seasonal	174D 12-5	1972	Mil. 6x6 2-1/2 T	1200	100	3 Engine
Seasonal	173B 12-6	1968	Mil. 6x6 2-1/2 T	2,000	250	3 Tender
Seasonal	174 H 12-8	1968	Chev. Mil. P.U. 4x4	150	150	3 Engine
Seasonal	174 E 12-9	1968	Chev. Mil. P.U. 4x4	200	50	6 Engine

**FPD #12 Staffing:** The district currently has 22 volunteer Firefighters and is governed by a three member Board of Commissioners.

**Fire Training Level:** All of the officers and fire commissioners have many years of involvement with the District. With an average of 25 volunteers in total, all have some level of experience on large and complex wildfires. Most of the firefighters have received training to the woodland Firefighter 1 level. DNR red cards are kept current with annual refresher classes. A current certification in basic First Aid is required of all firefighters. There are two Single Resource Bosses with several others in training. While wildfire ready, we are lacking in training for structure fires. And, although we respond to vehicle accidents within the district we do not have EMS training or equipment.

**Responses:** Average of 10 responses (wildland) and 1 (structural) annually within the district and average 3 responses to adjacent jurisdictions.

**Mutual Aid:** A formal mutual aid agreement currently exists between FPD #12 and WA DNR. In recent years FPD #12 has received numerous calls for assistance from WA DNR. FPD #12 is also a member of NE-WA-CO (Northeast Washington Coalition of fire suppression agencies)

**Jurisdiction boundaries:** Northeast of Ellisford, WA. The western boundary is bordered by Fire District #4 Tonasket and Fire District #1 Oroville in the Okanogan Valley. The elevation ranges from 1400 ft. at these boundaries to 3800 ft. on the north where WA DNR, BLM, and USFS properties border. The eastern boundary is a point approximately one-half mile west of Fancher Lake. The southeast roughly parallels the western side of the Antoine Canyon. The southern boundary traverses broken country to the southwest corner two miles west of Ellisford.

**Wildland fuel composition:** A wide variety of fuel models exists within FPD #12. The lowest elevations are in the south and west with a total gain of 2400 ft rising in the north and east half of the District. This creates an overall southern and western exposure. The fine low elevation grasses are typically dry enough to ignite easily by July. Sagebrush transitions into scattered ponderosa pine forests. This then becomes a complex mix with fir, tamarack and brush. This combination coupled with summertime upslope, up valley winds has historically created many fast moving large fires, very difficult to control. Roadways create the most significant firebreaks. Some overstocking and doghair thickets exist at various points along Swanson Mill Road. Water sources are limited/seasonal and widely scattered. Many water storage tanks are stationed on private lands throughout the District.

**Fire ignitions:** The area within FPD #12 is fire prone with a high frequency of lightning ignitions in June, July, August, and September. Additionally there are frequent human fire starts through the area. There are many absentee owners who frequent their property to recreate during the summer and hunting season. The lack of local fire danger knowledge adds to the human caused fires.

#### **FPD #12 NEEDS ASSESSMENT**

**Fire Training:** We currently have two firefighters certified as Single Resource Boss with a few more in training. The primary obstacle for obtaining this training is unpaid time commitments for the several weeks of required training at the ISC 230, 231 & 232 plus ISC 290 and leadership courses. We are also lacking in all training for structure fires.

**Fire Response Apparatus:** An aged fleet of vehicles is our primary limitation to responses. All of our vehicles are loaned/leased old military surplus except for the 1995 Ford F-350 (174A) which was purchased through WA DNR surplus.

**Fire Station:** The FPD #12 fire station is limited by size (two bays) to housing three vehicles year round. This severely limits our response time and capabilities for approximately six months out of the year when freezing weather is a problem. The fire station has no well. The only water on site is a 10,000 gallon tank for seasonal firefighting use. All of the FPD #12 water sources are located out of the district. Another fire station better located with a well would provide the district with a water source within the district and storage for additional apparatus. This would also provide room for training and education.

#### **4.8.14 Ferry/Okanogan County Fire Protection District #13**

**Fire Chief:** Tom Lindsey  
Telephone: 509-775-3604  
e-Mail: tlindsey@republic.wednet.edu  
Address: Ferry/Okanogan Fire Protection District #13  
350 E Delaware #5  
Republic, WA 99166

**Fire Commissioners:** Reed Heckly 509-775-2234  
Robert Fields 509-775-3548  
John Jensen 509-775-3065

**District Secretary:** Gae Lembcke 509-775-3521

#### **District Summary:**

The Ferry/Okanogan Fire Protection District #13 is authorized and guided by Title 52 of the Revised Code of Washington for Fire Protection Districts. Its primary responsibility is the protection of structural improvements and developments on lands within its district. It also has joint protection responsibilities with the Washington State Department of Natural Resources for protection from wildland fires.

The fire district boundary generally coincides with that of the Republic School District #309, with the addition of an annexed portion extending westward from Ferry County into Okanogan County along the state highway route 20 corridor. The district area is approximately 140 square miles with a population of approximately 3300.

Fire district staffing consists of:

- 35 – Firefighters (volunteer)
- 3 - Fire Commissioners (volunteer)

- 1 - District Secretary (part-time paid)
- 1 – Maintenance Worker (part-time paid)

The fire district is generally situated within the wooded valleys of the San Poil River and the Curlew Lake valley, including their tributaries. The valley bottoms are typically open and grassy where agriculture and development has cleared the forests. Uplands are generally wooded. Natural vegetation throughout the district creates a widespread Wildland/urban interface fire threat potential.

Approximately 1/3 of fire district values lie within the city limits of Republic, Wa., with remaining values existing in the rural areas of the district.

The local area has an active fire history. Large wildfires have been documented throughout Okanogan County. When large fires occur, citizens are reminded of the threat to their homes, and awareness of hazard fuels peaks for a time. However, the mental vividness of evacuations, warning bulletins, and firefighters and equipment pouring into the community to render assistance dulls with time. It is important for residents to understand the vulnerability of living within dense vegetation where dry summers create the potential for catastrophic fire events.

## **Trends**

### **1. *Shift in Property Ownership***

Property ownership within the fire district has been in transition for the last several decades away from traditional agricultural uses.

For many years prior to this trend, the majority of property values were settled within the City of Republic as businesses and concentrations of homes. However, as second or third generation rural homesteaders have aged, it has been common for ranches and small farms to be sold and subdivided. New property owners buy the small acreages often for recreational or retirement use. As rural lots and acreages continue to be developed, the net distribution of property values has shifted away from the centralized town of Republic into the rural areas. The immediate geography in and around the City of Republic has contributed to this shift since the steepness of the topography in and around the City of Republic is limiting to additional business and residential growth within the city limits.

This trend has pushed the distribution of homes (and resultant property values) into the rural areas, and a slow increase in rural business development is occurring also. This has in turn created a need to shift fire protection distribution strategies. Therefore, the fire district has begun a program to establish satellite fire halls to bring fire protection closer to rural properties.

### **2. *Shift in Natural Vegetation***

Forested vegetation throughout the western states is experiencing a general increase in density. As the country has developed in the past century, public demands for general suppression of wildland fires is recognized as having a significant effect upon the vegetation composition of forests and range lands. No longer are natural lightning fires or Native American burning allowed to ramble across the landscape throughout the summer months. The vegetation that was historically consumed in these frequent low-intensity fires now accumulates, resulting in thicker stands of trees and heavier loads of surface fuels. This trend equates simply to a net increase in available fuel for the next wildfire that might occur. These fuels present an additional hazard to rural properties.

Fires occurring where hazardous natural fuels have increased tend to be more intense and more difficult to suppress. An abundance of ladder fuels and interlocking tree canopies and brush enhance the chance of torching and crown fires. Firefighters are limited in their

effectiveness when fires move into aerial fuels, and safety concerns for firefighters and the public quickly become the primary concern when such scenarios develop. Homes and businesses built in close proximity to hazard fuels may not be defensible.

This fuels trend is subtle and continuous. Summer lightning ignitions will always occur. Populations will continue to live in the midst of this flammable environment. A greater effort must be made toward awareness and management of natural fuels and mitigating their hazard potential.

### **3. Shift in Firefighter Availability**

Recruiting volunteer firefighters is more difficult than in the past. Volunteer firefighters were traditionally recruited from among the businesses within the City of Republic. Business owners and store employees made up the bulk of firefighters for many years. The fire hall was centrally located, and the bulk of the homes and the population was situated in or near town. When the fire alarm sounded, a good turnout of firefighters could be depended upon.

However, recent recruitment efforts have raised concerns for the future. Several reasons may be contributing to this:

- The spirit of volunteerism is seemingly not as strong as in the past.
- Additional mandatory training requirements take away from the social aspects of meetings.
- Mounting liability concerns inhibit volunteers from taking on heavy responsibilities.
- Fewer businesses in a declining business district can arrange for employee coverage while an employee responds to a fire.
- Satellite halls in the rural areas limit recruitment to sparsely populated rural areas.
- More women-owned businesses and female employees exist in town than in the past that may not be interested in volunteering in what may be viewed as a male activity.
- A shift in age demographics, reflective of the influx of retirement building, toward older citizens that may not be interested in the rigors of firefighting.

This trend is subtle and may require a program of incentives to attract and recruit firefighters.

### **Priority Areas**

#### ***Neighborhoods:***

- Fire leaders have analyzed the fire district and divided the district into 11 neighborhoods. These neighborhoods have some commonalities such as transportation routes, fuel types, or topographic boundaries that are important from a fire suppression standpoint. Firefighters have prioritized these neighborhoods by level of concern and have identified, concerns, and recommendations for a variety of actions that would enhance the fire safeguarding of those neighborhoods. Those neighborhoods are: East Lake, West Lake, Granite, Hadley-Walker, North Republic, Southwest Republic, Southeast Republic, Klondike-Pine Grove, San Poil Valley, West Fork, Sweat Creek.

#### ***Residential Growth:***

- Fire prone developments in subdivisions surrounding Curlew Lake and up tributary creek drainages.
- Fire prone developments and subdivisions adjacent to and north of the City of Republic on Klondike Mountain.

#### ***Communications:***

- Establish another repeater for fire/ems to cover the dead spots around the boundary area between Curlew Lake and Malo.

### ***Firefighting Vehicles:***

- The district will need an additional structural engine for the planned satellite station on the west side of Curlew Lake.
- The district will need to upgrade the old tender stationed at the East Lake Hall. The tank leaks and the pump is too small for efficient use of the vehicle.
- Some of the older vehicles in the fleet are higher maintenance than the newer vehicles, and also do not provide as many efficiencies and safety features for firefighters as newer models that are up to the latest standards. Replacement or refurbishment of older apparatus must be an ongoing program as funding opportunities develop.

### ***Burn Permit Regulations:***

- The fire district does not administer a burn permit system. The fire district has relied upon a system established by the Washington State Department of Natural Resources (DNR) that allows outdoor burning under certain times of the year according to particular rules.
- During times of the year when DNR burning rules are relaxed, usually early spring and late fall, the fire district is frequently called out to suppress escaped fires started by homeowners burning grass and debris. Escape fire incidents have a negative impact upon the time and patience of volunteer firefighters. The volunteers are willing to help those in genuine need when fire threatens the community due to accidental reasons, but their enthusiasm wanes when their personal lives are interrupted by fires that have escaped due to poor planning or carelessness. Because of escaped burning incidents, there is a need to develop further cooperation and education between local law enforcement and Fire Chiefs to cooperatively enforce current laws regarding reckless and negligent fire use.

### **Effective Mitigation Strategies**

Programs to promote defensible space fuel reduction around fire prone structures is a valuable effort. Since the entire landscape is mostly vegetated with flammable material during the summer months, there is no single program that can reasonably mitigate the fire threat. Targeted fuel reduction programs focused around structures, utilities, critical infrastructure, and strategic fuel break corridors are a good step towards mitigating an overwhelming hazard fuel landscape.

### **Education and Training**

The extensive training requirements for firefighters is a large burden on volunteer departments. Even though the pool of firefighters contains many very experienced firefighters, documentation to prove the most basic of qualifications for either structural or wildland firefighting is slim. Training Officers are faced with a heavy workload and large liabilities. Firefighters are reluctant to commit to additional evenings for training on top of their fire responses. The training and qualifications issue is the largest challenge the fire district faces. While financial solutions do exist, the fire district cannot currently afford to fund financial remuneration for fire leadership and volunteers.

### **Cooperative Agreements**

The fire district has agreements in place with the following agencies:

- Washington State Department of Natural Resources
- Ferry/Okanogan Fire Protection District #14
- Ferry 3/Steven 8 Joint Fire Protection District
- Okanogan County Fire Districts Mutual Aid Agreement
- City of Republic

The fire district could benefit from agreements to clarify the relationships with the following agencies:

- Ferry County Sheriff
- Ferry County Public Utility District #1
- Republic Ambulance District
- Confederated Tribes of the Colville Reservation
- Bureau of Indian Affairs

The fire district would benefit from fire protection service contracts with the following agencies whose facilities are protected by the fire district without providing tax **Support:**

- Republic School District #309
- Ferry County Public Utility District #1
- Ferry County
- USDA-Forest Service, Republic Ranger District
- City of Republic
- State of Washington Department of Transportation

### Current Resources

The fire district is on a measured expansion program to realign facilities and equipment to the changing distribution of development within a Wildland/urban interface fire environment.

A “measured” expansion translates into a decided policy of avoiding debt if at all possible. Since the area is considered an economically depressed area, the fire district desires to build and expand only as the funds are accumulated from annual tax revenues. There is no desire to increase taxes upon a citizenry where financial difficulties are common and employment opportunities are very limited.

### **Station #1 - Republic Fire Station, 645 S Keller, Republic, WA**

**Table 4.40. Fire District #13 Station #1 Equipment List.**

Year	Make	Model	Tank Capacity	Pump Capacity
2001	Ford	F-550	500 gal	250 gpm
2000	Ford	F-450	300 gal	100 gpm
1986	Ford	F-350	300 gal	125 gpm
1978	Ford	F-650	750 gal	750 gpm
1996	Kenworth	W900	3600 gal	650 gpm
1978	Kenworth	W900	4000 gal	650 gpm
1995	Ford	F-350	Crew Cab Pickup	

The following equipment is available at the Republic Station or on trucks stationed at Republic.

- 4 - 2500 gal collapsible snap tanks
- 1 – 2.5” stationary monitor
- 1 – 8 hp floata-pump
- 1 – 15 cfm Breathable Air Compressor

- 1 – Dual SCBA air cylinder containment fill station
- 1 – 30' Indoor maintenance lift
- 25 – 5 gal Class A foam

**Station #2 – East Lake Fire Station, 17123 Highway 21 N, Republic, WA**

**Table 4.41. Fire District #13 East Lake Fire Station Equipment List.**

Year	Make	Model	Tank Capacity	Pump Capacity
1982	Chevrolet	C-30	300 gal	125 gpm
1978	Kenworth	W900	3800 gal	250 gpm
2000	International	4800	1800 gal	650 gpm
1965	Ford	F-650	1000 gal	1000 gpm
1972	International	?	300 gal	50 gpm

**Future Considerations:**

The trend of dwindling industrial activity in the fire district will degrade the tax revenues over time. Poor economics will continue to be a limiting factor in providing adequate fire protection unless business and industry can be attracted to the area.

**Needs:**

Fire district leaders have developed a list of general issues and considerations that pertain to multiple neighborhoods or the district in general, which have been incorporated into the Chapter 5 of this document.

#### **4.8.15 Ferry/Okanogan County Fire Protection District #14**

**Chief:** John Foster Fanning

**District Summary**

**Location:** NW Okanogan County and NE Okanogan County of Washington State.

**Size:** 79,953 private acres (124 square miles; 77,733 acres FY CO, 2,220 acres OK CO).

**Serving:** approximately 1,700 citizens with an estimated 800 structures.

**Tax Revenue:** 2005 (estimated) - \$61,000.

**Assessed value real property:** \$60,975,333.

**Topography:** Mountainous with three primary, narrow valleys and many steep drainages.

**Demographics:** Unchecked development of interface neighborhoods in narrow, mountainous valleys. Small ranches and farms in larger valley bottoms and some uplands. Isolated mountain homes and cabins.

Approximately 80% of land in the 'north-half' of Okanogan County is under governmental management of Forest Service, Washington Department of Natural Resources or the Bureau of Land Management.

**Strategic Layout:** FPD #14 has one primary station (town of Curlew) and three 'satellite' stations in the communities of Danville, Malo and Toroda.

**FPD #14 Operations:** FPD #14 is divided into two operation divisions; Fire and Medical. Each division has a commanding chief.

**Responses:** Average of thirty fire responses (wildland and structural) and 100+ emergency medical responses annually. (Two recent state mobilizations – Mount Leona 2001 and Curlew Complex 2002).

**Jurisdiction boundaries:** Northern boundary is approximately 9 miles of east/west international border with the closest Canada fire station 14 miles from Curlew. Eastern boundary is USFS lands of the Kettle Range, we respond to highway accidents and medical incidents to summit of Boulder/Deer Creek Pass within USFS boundary with the nearest FPD #3 station 27 miles from Curlew. Western boundary is along Toroda Creek with the closest Okanogan County fire station 29 miles from Curlew. Southern boundary is near the junction of Hwy 21 and the W Curlew Lake road with the nearest FPD #14 station 22 miles from Curlew.

**Wildland fuel composition:** A fire-adapted ecosystem of dry site ponderosa pine, Douglas-fir and associated vegetation. Historically, the fire regime was frequent, low-severity wildfires. Successful fire suppression, coupled with the various land management practices have led to overstocking of small trees (doghair thickets) and an excess of surface debris and brush. This overstocking of vegetation and buildup of surface fuels has led to conditions with high potential to result in frequent moderate to high-severity wildfires. These fires come with an elevated potential for negative effects to our communities.

**Fire ignitions & Risk Assessment:** Our area is fire prone with a high frequency of lighting ignitions in June, July, August and September. Additionally there are frequent human fire starts throughout the region. The WA DNR Urban Interface Risk Assessment program lists our 'neighborhoods' fire risk as high.

### Current Resources

Two verified ambulances, seven initial attack fire engines, and one command car.

**Table 4.42. Fire District #14 Equipment List.**

Station	Make/Model	Drive	Type	Tank Capacity (GPM)	Pump Capacity (GPM)
Curlew		4X4	Wildland T6	300	120
Curlew	International	2x4	Tender	3,000	
Curlew	1999 Ford	4X4	Wildland T6	300	120
Danville	Jeep	4X4	Wildland T6	250	100
Toroda	Ford	4X4	Wildland T3	1,000	240
Malo	International	6X6	Wildland T4	1,000	120
Toroda	Ford		Structural	1,000	
Curlew	Ford		Structural	750	

Twenty-three volunteer EMS providers and 30 volunteer Firefighters of which six members are cross-trained in both response disciplines. The District is governed by an elected three-member Board of Commissioners. There is also an auxiliary support unit made up of a dozen private citizens.

All firefighters are on schedule or currently trained at basic firefighter 1 level for both structural and wildland firefighter (Red Card). One commander is certified at Incident Command Type 3 and Division Group Supervisor. No other certified line rated staff.

### Cooperative Agreements

Formal Mutual-aid agreements exist between FPD #14 and WA DNR and FPD #13. Currently Mutual-aid agreements are in draft stages with local USFS Job Corps compound, Grand Forks



British Columbia, Canada and FPD #3. Between 2000 and 2004 FY/OK FPD #14 responded to 34 calls for assistance from Washington State DNR.

FPD #14 is a founding member of NE-WA-CO (Northeast Washington Coalition of fire suppression agencies). Two of the seven initial attack engines are non-tax based allowing FPD #14 a history of responding to mobilization calls outside jurisdictional boundaries; some examples of which are 1991 Firestorm, 1994 Tyee & Rat Creek Complex fires, 1994 Copper Butte, 1994 Palmer Complex fires, 1994 Spokane Riverside fire, 1996 Bowie Road, 1999 Lemansky Pines fire, 2000 Cayuse Cooker and Rocky Hull, 2001 Mount Leona, Tonasket Complex, 2003 Togo fire. Additionally numerous minor responses have occurred supporting the WA DNR during lightning bust ignitions.

FPD #14 is active on a regional basis with members serving on various emergency management boards, i.e. Chair of FY CO E-911 Governing Board, Chair and Secretary of FY CO Trauma Care Council, Alternate representative to East Region Trauma Care Council, Chair and Secretary of FY CO Fire Prevention Cooperative, Coordinator of NE-WA-CO, Regional EMS trainer, representative on Five Star Enterprise Community, representative to regional disaster preparedness committee.

### **Needs Assessment**

While only one member is certified in a line rated position for wildland fire, we have many long term members who have skills, knowledge, and abilities at Resource Boss, Strike Team Leader, and other advanced levels. The primary obstacle for obtaining this training is unpaid time commitments for the several weeks of required training at the ISC 230, 231, & 232 plus ISC 290 and leadership courses.

An aging fleet of apparatus is our primary limitation. The newest vehicle of our fleet is a 1999 F-450 Ford which came to the District surplus from the USFS Colville National Forest in 2005. Much of our heavy rolling stock is late 1960 vintage and up for replacement.

Additionally, the District currently has no water tenders on inventory. This is a gaping hole in our water transport and portable hydrant ability. We have recently acquired one surplus Kenworth tractor truck for building a tender but have not yet amassed the funding to do so.

While the primary station of the District is new (2004/05) five bay facility located in the town of Curlew, we are still in need of additional development of stations. The two bay, three apparatus station in Toroda (1998) is adequate for current needs. The single bay, single apparatus stations in Malo and Danville are much less than adequate for current needs. Stations similar to the Toroda station need to be built in both the Danville and Malo locations.

## **4.8.16 Douglas/Okanogan County Fire District #15**

Brewster Chief: Mike Webster  
Telephone: 509-689-9408  
e-Mail: [mwebbie2003@yahoo.com](mailto:mwebbie2003@yahoo.com)  
Address: Box 335, Brewster, WA 98812

Pateros Chief: Mike Lambert  
Telephone: 509-679-8795  
e-Mail: [fire11@nwi.net](mailto:fire11@nwi.net)

Methow Chief: Joe Kitzman  
Telephone: 509-679-0285  
e-Mail: [kitz@cuonlinenow.com](mailto:kitz@cuonlinenow.com)

District Administrator: Bill Vallance  
Telephone: 509-689-0216  
e-Mail: [ocfd5fireadmin@ncidata.com](mailto:ocfd5fireadmin@ncidata.com)  
Address: Box 490, Brewster, WA 98812

### District Summary:

Fire District 15 covers 220 square miles in two counties. We operate four stations, Brewster, Pateros, Methow and the Bridgeport Bar. We respond to over 120 calls a year from brush fires to structure, vehicle fires to vehicle accidents. Our District also owns and operates an ambulance service that employs four EMT-I's.

### Priority Areas:

**Residential Growth:** the Alta Lake area, Methow, French Creek area has had a big growth of new homes over the past two to three years. We need to improve our fire service to those areas as well as Brewster, Pateros and Bridgeport Bar areas.

**Communications:** We need to improve our communications in the Methow area as well as the areas of our district surrounding Bridgeport.

**Firefighting Vehicles:** We currently need an Urban Interface Apparatus in Methow and a rescue in Brewster along with several brush trucks in the near future. Upgrading of fire apparatus is always a priority to properly maintain adequate fire services to our tax payers.

**Burn Permit Regulations:** We have no permit process in place at this time. We do, on occasion, issue camp fire permits to home owners, but use the County made burn permit.

**Education and Training:** All our firefighters are Red Card qualified. A long with that we have several who are Crew Boss, Engine Boss qualified. Our structural firefighting is mostly in-house training. We do have state instructors on our roster and do go to North Bend for live fire training when we can.

We believe a training facility, either here within our district or somewhere within in the County, is a necessity for our volunteers to get good quality training with out having the burden and costs of traveling out of area.

**Cooperative Agreements:** Our District as mutual aid agreements with surrounding departments within Okanogan County and Douglas County. These probably need to be updated.

### Current Resources:

#### Station #1: Brewster

Table 4.43. Fire District #15 Station #1 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1987	Chev	4X4	250 gallons	
1990	Dodge	4X4	250 gallons	
1993	Chevrolet	3500 4X4	250 gallons	
2000	BME	Structural CAFS Engine	1,000 gallons	1250 gpm
1993	Ford L8000	Tender	3,000 gallons	
1973	Pierce	Structural Engine	750 gallons	1250 gpm

### **Station #2: Pateros**

Table 4.44. Fire District #15 Station #2 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1988	Chevrolet	4X4	250 gallons	
1994	International Navistar	4X4	1,000 gallons	750 gpm
1979	Peterbuilt	Tender	4,000 gallons	

### **Station #3: Methow**

Table 4.45. Fire District #15 Station #3 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
1981	Ford	4X4	250 gallons	
1973	International	Pumper Engine	500 gallons	750 gpm
1980	International	Tender	4,000 gallons	

### **Station #4: Rocky Butte**

Table 4.46. Fire District #15 Station #4 Equipment List.				
Year	Make	Model	Tank Capacity	Pump Capacity
2000	International	4X4	1,000 gallons	
1975	Ford	tender	4,000 gallons	

**Future Considerations:** A fire station and equipment in the Alta Lake area, a new station in Methow, improve our communication needs with repeaters in dead areas. Retention and recruitment of volunteers. Updating our contracts with neighboring agencies. Developing contingency plans for the urban interface areas of our district. Improve relationships with the cities, Brewster Pateros and Bridgeport, that we work closely with.

**Needs:** Our district is always in need of firefighters, volunteers. We need adequate training facilities. Our top three needs right now are a new station in Pateros, New apparatus for Methow and a new apparatus for Brewster. Also we are need of replacing our old brush trucks.

## **4.8.17 Okanogan County Fire District #16**

Chief: TBD

E-Mail: fire16@pcnuthut.com

Address: PO Box 1649, Tonasket, WA 98855

#### **Commissioners:**

Sam Wright 509-486-4800

Tim Kenyon 509-486-1229

Roger Prater 509-486-2735

#### **District Summary:**

**Location:** The Aeneas Valley is located in NE Okanogan County in Washington State approximately 18 miles SE of Tonasket. The main basic corridors of the district will be the Aeneas Valley Road to just past Cape LaBelle Road and follow Cape LaBelle Road for approximately 7 miles.

**Size:** approximately 16.98 square miles and 10, 870 acres

**Population served:**

**Tax Revenue:** 2006 (estimated) \$18,000

**Assessed value real property:** \$18,808,000

**Topography:** The general Aeneas Valley is a broad drainage running NW to SE with numerous smaller drainages dropping into the main valley from the surrounding mountains. The main valley at 2,800 feet is bordered to the east and west with mountains reaching up to 4,500. While the lower reaches of Aeneas Valley can be broad and open the topography is typically steeper and rugged approaching the higher elevations.

This topographic arrangement has multiple affect of fuels, demographics, infrastructure, landownership and wildland fires (see topics below).

The valley floor is much denser in both structures and population with smaller parcels of land with easier access for fire equipment. Rising from approximately 2,800' to over 4,500' the district has challenges with regards to both weather as well as having an adequate water supply in the higher elevations. There are also many isolated homes and cabins with difficult access especially in the winter months. The district borders approximately 9 miles of the Okanogan National Forest. In the valley floor the vegetation ranges from grassland to smaller, isolated stands of Ponderosa pine. This trend continues the same as you move up in elevation changing to a higher density of trees from 3,500' and up. The Northeast portion of the district borders the Okanogan National Forest with a very high density of ponderosa pine.

**Strategic Layout:** OKFPD #16 is Okanogan County's newest Fire Protection District. No Strategic layout is in place at this time.

**Residential Growth:** The growth in the Aeneas Valley is well documented both by value through the Assessors Office as well as building permits issued through the Okanogan County Building Department. In the past 3 years a growth of 138% has been documented within the boundaries of the district.

**Demographics:** One of the fastest growing areas in Okanogan County the Aeneas Valley is rapidly outgrowing its infrastructure creating a textbook example of the Wildland/Urban Interface (WUI). The population base is moving more towards retired couples building their dream retirement home. There are a few small, home-based businesses as well as those who commute to either Tonasket, Okanogan, or as far away as the West side of the state.

**Wildland Fuel Composition:** Aeneas Valley floor fuel composition is given to a mixture of timber plots, grazing pastures and irrigated agricultural lands. These are also a limited component of scrub brush and indigenous grasses. Stringers of timber extend into the valley floor from intersecting drainages. Both the lower valley area and the upper reaches of the surrounding mountains are dry site, fire prone landscapes.

Adjacent forests of ponderosa pine are intermixed with Douglas-fir and occasional western larch. These timber stands are often thick with heavy ground and ladder fuels. There is also a lack of management of these forests tracks leading to overstocking, unhealthy stands and fire prone conditions.

At all levels cheatgrass and shrub fuels and needle cast are the prime fire carriers.

**Fire Ignition & Risk Assessment:** The Aeneas valley is prone to lightning strikes throughout the dry-season summer months. With the rapid increase of population and structures the additional risk of human fire starts is increasing. The Washington DNR Interface Risk Assessment program lists the Aeneas Valley as a high-risk area.

**Effective Mitigation Strategies:** OK FPD #16 is in good position to partner with the Okanogan National Forest, the WA DNR and the Colville BIA for fuels reduction and community education projects. There are several projects being considered and/or planned on federal land by the US Forest Service. The future fire district will endorse the Firewise program, or something similar, to

enhance the district and reduce the fire danger around resident's homes to increase the safety of firefighters.

**OK FPD #16 Operations:** Due to recent formation, OK FPD #16 operations are limited. Plans include 1) training for and coordinating wildland fire suppression responses and 2) training for and coordinating structural fire suppression responses. Firefighters will be encouraged but not required to obtain EMT status. Basic first aid will be a requirement of all firefighters. EMS is covered by the Tonasket EMS District and taxed separately. The boundaries of the EMS district are larger than the boundaries of the OKFPD #16 but include the entire fire district.

**Current Resources:** None

**FPD #16 Staffing:** Efforts will soon begin to recruit volunteers for the newly formed district. Currently the district has (1) one NWCG qualified level II firefighter and (1) one NWCG level I firefighter (red cards). As noted basic first aid will be included in our training plans. The two qualified firefighters mentioned have committed to the Burn to Learn program in the winter or spring timeframe. There are also a number of retired volunteer and paid firefighters within the district who we hope will be willing to help and build the base of qualified firefighters in the community.

**Education and Training:** The new district will be constantly looking at every opportunity to train new firefighters/residents. We are working towards basic training to establish a base of Wildland Firefighter II firefighters. Training would be administered using in-house trained instructors, training officers from Region 6 as well as combining with other fire protection districts, the DNR, US Forest Service and other agencies. We will also constantly work both internally as well as with neighboring districts on wildland and structural training.

**Responses:** Currently there have been no responses by the district due to its start-up nature. In the past 2 years residents with both equipment and training as well as local untrained residents have responded to approximately 25 fires either within or just outside the district, which would have been responded to by the OK FPD #16.

**Burn Permit Regulations:** Enforcement of fire regulations will remain the responsibility of the Department of Natural Resources and the Okanogan County Sheriffs office.

**Cooperative Agreements & Interagency Participation:** Mutual Aid (M/A) Agreements are FPD to FPD within the county area; Suppression Agreements are with the WA DNR. It is anticipated the newly elected fire commissioners would adopt the standing Countywide M/A agreement. Additionally by having a Fire Protection District in place, if a large interface fire threatens Aeneas Valley, State Mobilization could be enacted.

**Priority Areas:** The main focus on the area would be documented and expected growth and the changing demographics of the area.

### **OKFPD #16 Needs Assessment:**

**Fire Training:** As noted above efforts will soon begin to recruit volunteers for the newly formed district. Currently the district has two trained NWCG wildland certified firefighters. The goal is to have all fire fighters trained to NWCG level of FF2. Other goals include four qualified Engine Boss / Incident Commander Type 4 or higher with one qualified Strike Team Leader. There are a number of retired fire fighters within the district who we hope will be willing to help and build the base of qualified fire fighters in the community. We will also take full advantage of the Burn to Learn program as well as combining with other districts to pool our training resources and opportunities. Every opportunity will be closely examined to train new fire fighters/residents. Our basic need of having trained structural fire fighters is an issue and needs to be addressed as soon as possible.

### **Anticipated Training Needs:**

- 6+ recruits (approximately ) to Wildland Fire Fighter II S-190, S-130, I-180, etc. Spring 2007 or 2008
- 2+ Wildland Fire Fighter to S-231 Spring 2007 or 2008 (this number will be higher if we wait until 2008)
- 2+ Advanced Fire Fighter I to S-290, S-230, S-231 for advancement to Resource boss / ICT 4 Spring 2007 or 2008
- All recruits and fire fighters to structural fire training as available

**Fire Response Apparatus:** As a new district with a very small budget (approx. \$18, 000 per year) our vehicles will be obtained by any and all methods available to us, none of which will involve a monetary exchange. We are currently researching grants as well as using the FEPP program to obtain some vehicles. Our first and foremost need is a small fleet of reliable first response vehicles, which have a wide range of capabilities with as many as feasible to be 4wd. Another concern is the availability of an adequate water supply at higher elevations. Therefore, one of our needs would be multiple water tenders. Engines are also crucial to deliver the water supply. Due to the demographic, geographic, weather and historical fire data on file our needs include:

- 2 reliable Type 6 4wd wildland trucks
- 1 Type 4 (preferably 4wd) wildland truck
- 2 2500+ gallon water tenders
- 1 short wheelbase structure truck (preferably 4wd) to be used in the accessible areas on the valley floor and residences throughout the district where accessibility is not an issue.

We do have a few resources in the valley that would be looked at to supplement our efforts at the start, which would be less costly to operate on an as needed, contract basis.

**Fire Stations:** Currently the lack of revenue makes erecting a fire station unfeasible. OK FPD #16 does have individuals willing to donate property to the district for the placement of a firehouse. Which property(s) to consider will be a decision in the hands of the fire commissioners. At this time there is also no place to park fire apparatus out of the weather. Until a station exists, cold weather fire protection will be drastically hampered due to weather related issues.

### **Current Fire Station Needs:**

- One completed fire station / garage to house with the ability to expand as needed. Approximate cost approximately \$100,000.

## **4.9 Wildland Fire Districts**

### **4.9.1 Washington Department of Natural Resources**

#### **4.9.1.1 South Okanogan District**

This document contains four segments pertaining to wildland fire suppression capabilities. The segments are as follows:

1. WA DNR policy on fire suppression

2. Geographical/Geopolitical profile of WA DNR South Okanogan District
3. Signed Agreements between WA DNR and other agencies
4. Staffing, Apparatus and shared resources in South Okanogan District

## **WA DNR POLICY ON FIRE SUPPRESSION**

The priorities of WA DNR's fire control program are (in order) to:

1. Protect human life
2. Protect natural resources
3. Minimize resource losses and fire costs

When structures are threatened, WA DNR will cooperate fully with Fire Protection Districts using unified command, to meet priorities of both agencies.

WA DNR personnel and equipment may provide assistance on structural fires as long as they do not enter the structures.

## **PROFILE OF SOUTH OKANOGAN DISTRICT FIRE PROTECTION AREA**

**Location:** The south half of Okanogan County, Washington State.

**Size:** South Okanogan District spans more than 1,000,000 acres of ownerships and jurisdictions.

### **State Lands with wildfire protection within South Okanogan District**

Approximately 250,000 acres (includes both WA DNR and WDFW managed lands).

### **Forest Protection Assessments on private lands within South Okanogan District**

Approximately 300,000 acres (these acres also include private lands within the Colville Reservation).

### **Fire Protection Districts within WA DNR South Okanogan District**

Okanogan County FPD #3 (Omak/Okanogan/Malott)  
 Okanogan County FPD #4 (Tonasket)  
 Okanogan County FPD #6 (Carlton/Twisp/Winthrop/Mazama)  
 Okanogan County FPD #7 (Riverside)  
 Okanogan County FPD #8 (east of the Okanogan River on Colville Indian Reservation)  
 Okanogan County FPD #9 (Conconully)  
 Okanogan & Douglas Counties FPD #15 (Brewster/ Pateros/ Methow/Bridgeport)

### **WA DNR South Okanogan District reciprocal coverage with the Okanogan/Wenatchee National Forest**

Usually extends one mile onto each agencies adjoining jurisdiction along the State Highway 153 corridor and one mile onto each agencies adjoining jurisdiction along the west WA DNR property line of the Loup Loup State Forest.

## **WA DNR SIGNED AGREEMENTS WITH THE BLM, USFS, BIA, FIRE PROTECTION DISTRICTS AND CANADA**

Master Cooperative Fire Protection Agreement  
 Northwest Operating Plan  
 Eastern WA Local Operating Plan  
 Local Operating Plan

All FPD's have Forestland Fire Response Agreements with WA DNR in South Okanogan District except FPD #7. FPD #8 has a Forestland Fire Response Agreement with the Colville Confederated Tribes.

### **WA DNR signed Agreement with Canada**

Northwest Wildland Fire Protection Agreement (Northwest Compact) Cooperative Operating Plan.

### **SOUTH OKANOGAN DISTRICT STAFFING, APPARATUS AND SHARED RESOURCES**

South Okanogan District of WA DNR has a Resource Protection & Services Staff (RP&S) who work in wildfire prevention, pre-suppression, suppression and smoke management.

#### **Work Station & Resource Base Area:**

The district has one primary work center located at the Omak Airport. The Northeast Region Office is located in Colville, Washington.

#### **Personnel**

South Okanogan District fire staff totals 24 individuals. Three of the 24 staff members are permanent full time employees. The other 21 staff members are comprised of seven Natural Resource Worker 2 (NRW2) positions. Employment duration for these seven positions is usually between mid April and mid October and 14 firefighters (employment duration for the firefighters is usually three months).

An additional three permanent State Lands staff members participate in the fire program as needed.

#### **South Okanogan Engines**

At full strength, South Okanogan District seasonally staffs five 4x4 Type 6 brush engines, one Type 5 engine and one 4x4 Type 7 brush engine. The seven engines each usually has a three person firefighting crew. Not all engines work every day of the week (except Tuesday's thru Thursday's) and staffing levels vary as fire season draws to an end. Usually when "Red Flag" warnings are predicted, additional engines (usually a strike team of Type 6 engines) are requested to assist the district in initial attack.

The engine drivers and firefighters are supervised by a Natural Resource Specialist 1 (Forester 1). It is the expectation of the person in the Forester 1 position to become Strike Team/Task Force Leader qualified.

#### **Engine Working Circles**

Engine 211 the Chilliwist area.

Engine 221 the North Omak/Riverside Block areas.

Engine 222 the Brewster area

Engine 223 the North Loup Block area.

Engine 224 the Chilliwist/North Omak/North Loup Block areas.

Engine 225 the Carlton/Twisp/Winthrop/Mazama areas.

Engine 251 the Pateros/ Lower Methow Valley areas.

Qualifications of the engine drivers and firefighters may vary season to season due to turn over rates. Qualifications may range from first year firefighter to Type 4 I.C./Resource Boss/Fire Investigator.

#### **Current South Okanogan Permanent Employee Staffing**

District Manager; Division/Group Supervisor IT and Type 3 I.C. IT.



Fire Control Unit Forester; Operations Section Chief Type 2.  
Land Manager 2; Division/Group Supervisor and Type 3 I.C.  
State Lands Unit Forester; Division/Group Supervisor and Type 3 I.C.  
Forester 1 Fire Control; Resource Boss IT.  
Forester 1 State Lands; Task Force/Strike Team Leader.

#### **Other Available and Shared Resources**

Both South Okanogan and Highlands Districts cooperate between the two districts. Personnel, resources and equipment are shared when initial attack resources are spread thin.

South Okanogan District maintains a call when needed Dozer Agreement list and Faller Agreement list. Dozer sizes can range from D-4 to D-8.

The district also has a 2,000 gallon tender.

WA DNR helicopter(s) are staged at the Omak Airport throughout fire season for initial attack. The helicopter staged at the airport is usually a Bell 205 with helitack crew. Occasionally a Bell AH-1S Cobra will be staged at the airport when higher fire danger occurs.

South Okanogan District also has utilized the WA DNR PBY staged at Deer Park.

A BIA SEAT has been available to WA DNR at the Omak Airport for initial attack over recent fire seasons.

Canadian air tankers and lead plane are utilized for initial attack if available.

#### **4.9.1.2 Highlands District**

This document contains three segments pertaining to wildland fire suppression capabilities. The segments are as follows:

1. Geopolitical profile of WA DNR Highlands District
2. Staffing and Apparatus
3. Historic perspective of wildland fire within Highlands District

#### **PROFILE OF HIGHLANDS DISTRICT FIRE PROTECTION AREA**

**Location:** Northwest Ferry County and north Okanogan County of Washington State. From the Canadian Border south to the boundary of the Colville Confederated Tribes reservation. From the foothills of the Cascade Range, east to the Kettle Range;

**Size:** Highlands District spans a 1,330,000 acre mosaic of ownerships and jurisdictions.

**Topography:** Primarily mountainous with three narrow, agricultural valleys. Topographic variations range from 900' to 8,000'. Uplands are a mixture of very rugged, often rocky slopes giving way to either rolling highlands or partially timbered rounded mountains.

**Demographics:** Inside the DNR District are portions of Ferry and Okanogan counties with two E-911 Dispatching Centers and Emergency Service Operations. Three incorporated cities; Oroville, Tonasket and Republic, all have WUI neighborhoods developing outside their city boundaries. Additionally six towns and numerous communities provide a multiplex of rural/urban interface neighborhoods developing in mountainous drainages within perennial fire ecology with a history of complex, costly wildfires.

#### **State Lands with wildfire protection within Highlands District**

Ferry County - 26,785 DNR Acres  
Okanogan County - 178,711 DNR Acres

### **Forest Patrol Assessments:**

Forest Patrol assessed tax private lands within Highlands District 601,193 acres

### **Fire Protection Districts within WA DNR Highlands District:**

Okanogan County FPD #1 (Oroville)	15,240 acres
Okanogan County FPD #4 (Tonasket)	32,480 acres
Okanogan County FPD #10 (Loomis)	4,380 acres
Okanogan County FPD #11 (Chesaw/Molson)	63,000 acres
Okanogan County FPD #12 (Swanson Mill Road)	9,400 acres
Ferry/Okanogan County FPD #13 (Republic)	80,460 acres
Ferry/Okanogan County FPD #14 (Curlew)	77,233 acres

Collectively 282,193 FPD acres are in Highlands District 90% of which pay forest patrol assessment.

Additionally Okanogan County has approximately 319,750 acres of private land (approximately 2,700 homes) in Highlands District, paying forest patrol assessment without fire protection district coverage.

### **WA DNR Highlands District reciprocal coverage on U.S. Forest Service:**

WA DNR / USFS Reciprocal Agreement in Okanogan County	181,120 acres.
WA DNR / USFS Reciprocal Agreement in Ferry County	104,960 acres.

### **HIGHLANDS DISTRICT STAFFING & APPARATUS**

Highlands District of the Washington State, Department of Natural Resources has a Resource Protection & Services (RP&S) group who work in wildfire prevention, presuppression and suppression.

### **Work Stations & Resource Base Areas:**

The district has one primary and one secondary workstation with locations as follows:

**Highlands Fire Camp** - on the western side of the district near Loomis WA, west of Tonasket. This facility and base for and houses firefighting inventory of the Highlands 20 person crew and several Highland's fire command staff. The facility is also capable of housing a Type 2 Incident Management Team (IMT).

**Kellogg Work Center** – on the eastern side in the town of Curlew. This facility is base for and houses the inventory of the six Highlands Engine Companies and serves as base for one of Highlands's fire command staff.

### **PERSONNEL**

The Highlands District fire program staff totals 42 individuals, including 3 permanent employees, 6 career-seasonal employees who work up to nine months each year, and 33 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

An additional 8 other employees work within the district in other programs, but frequently assist in the fire program.

**Highlands 20 Crew:** The Highlands District is home to the Highlands 20 Person Crew based out of Highlands Fire Camp. This crew has the following resources:

1. Crew Supervisor is certified Division/Group Supervisor and Incident Commander Type 3 (IT)

2. Two Assistant Crew Supervisors are certified Single Resource Boss (IT)
3. Seventeen other wildland firefighters range in certification from firefighter 1 & 2.

**Highlands Engine Companies:** The Highlands District seasonally staffs six Type 6 brush engines with a three-person firefighting crew in each engine. Engine staffing is on a varied schedule that provides seven day per week coverage June through September. The DNR utilizes a “home guard” approach in that the seasonal engine drivers park their assigned engines at their residence within their assigned geographic area of the district.

**Highlands Engine Company Command:**

Crew Supervisor is certified Division/Group Supervisor, Incident Commander Type 3, Wildland Fire Investigator & Safety Officer Type 2 (IT).

**Highlands Engine 121** – based in the Oroville area. The engine leader is certified Single Resource Boss Engine, Dozer, Crew and Initial Attack Incident Commander Type 4.

**Highlands Engine 122** – based in the Curlew area

**Highlands Engine 123** – based in the Tonasket area. The engine leader is certified Single Resource Boss Engine, Dozer, Crew and Initial Attack Incident Commander Type 4.

**Highlands Engine 124** – Molson/Chesaw area. The engine leader is certified Single Resource Boss Engine, Dozer, Crew and Initial Attack Incident Commander Type 4.

**Highlands Engine 125** – based in the Republic area. The engine leader is certified Single Resource Boss Engine, Dozer, Crew and Initial Attack Incident Commander Type 4.

**Highlands Engine 126** – based in the Aeneas Valley area (leader is IT SRB)

**Other Highlands District Staffing:**

- District Manager – Task Force Leader
- Fire Control Unit Forester –Safety Officer Type 2, Incident Commander Type 3, Division/Group Supervisor, Wildland Fire Investigator.
- Grazing/Rec Land Manager – Incident Commander Type 3, Division/Group Supervisor,
- General Repairer/ Maintenance Mechanic – I. C. Type 3, Division/Group Supervisor
- Recreation NRW2 – Single Resource Boss Dozer, Wildland Fire Investigator
- Timber Sales Unit Forester – Incident Commander Type 3 (IT), Div/Group Supervisor (IT)
- Four State Lands Foresters – all working toward Single Resource Boss certification.

**Other Resources Available**

The DNR maintains call when needed contracts for dozers and operators trained and equipped for fire suppression throughout the district.

**Disclaimer**

Structural Fire Suppression - DNR crews are not trained or equipped for structure suppression. Primary protection responsibilities are on private and state forest land throughout Northeast Washington and the DNR also responds to fires off of DNR jurisdiction which threaten DNR protection.

Emergency Medical Services - The DNR does not provide formal EMT services. The crews are trained in first-aid, and some staff members have EMT and first-responder training, but this is not a service the DNR provides as part of its organization.

#### **4.9.2 Bureau of Land Management – Spokane District**

Chief: Scott Boyd - Fire Management Officer BLM  
Telephone: 509-536-1237  
e-Mail: [sboyd@or.blm.gov](mailto:sboyd@or.blm.gov)  
Address: 1103 N Fancher, Spokane, WA 99212

##### **District Summary**

The Spokane District BLM has 2 engines. One is located in Spokane and the other is located in Wenatchee. With the District's scattered pattern, the engines are usually on scene after initial attack forces arrive. The engines are available off district and out of state if needed.

##### **Cooperative Agreements**

The Spokane Dist. BLM has Coop agreements with the Colville National Forest and DNR.

##### **Current Resources**

###### ***Station #1 Spokane District Office, Spokane, Wa***

**Table 4.47. Spokane District Office Equipment List.**

<b>Year</b>	<b>Make</b>	<b>Model</b>	<b>Tank Capacity</b>	<b>Pump Capacity</b>
2000	Ford	F 450	309 gal capacity	30 gals / min

###### ***Station #2 Wenatchee Field Office, Wenatchee, Wa***

**Table 4.48. Wenatchee Field Office Equipment List.**

<b>Year</b>	<b>Make</b>	<b>Model</b>	<b>Tank Capacity</b>	<b>Pump Capacity</b>
2001	Ford	F 550	309 gal capacity	30 gals / min

#### **4.9.3 USDA Forest Service – Okanogan and Wenatchee National Forests**

Chief: Bobbie Scopa - Fire Management Officer  
Telephone: 509-664-9333  
e-Mail: [bscopa@fs.fed.us](mailto:bscopa@fs.fed.us)  
Address: 215 Melody Lane, Wenatchee, WA 98801

##### **Forest Summary**

The Okanogan-Wenatchee National Forests (OWF) cover nearly 4 million acres of forested lands on the eastern slopes of the Cascade Mountains. National forest lands span from the Canadian border south to the Yakima Indian Reservation and from the Cascade crest east to the Columbia River on the Wenatchee National Forest and to the Okanogan County line on the Okanogan National Forest. The OWF has 7 Ranger Districts, two of which are in Okanogan County. There are approximately 900 red carded Forest Service employees that participate directly in fire suppression or support of fire suppression activities.

##### **Current Resource Summary**

Table 4.49. Okanogan – Wenatchee National Forest 2006 Resource List.

Resource Type	Resource Designator	Daily Staffing # (personnel/day)	Effective # days/week	Total personnel for coverage	Dates available	Firefighter Production Capacity
<b>Engines</b>						
T3	E-31	3	5	3	6/12-10/7	6
	E-32	3	5	3	6/12-10/7	6
	E-41	3	5	3	6/12-10/7	6
	E-71	3	5	3	6/12-10/7	6
	E-81	3	5	3	6/12-10/7	6
	E-82	3	5	3	6/12-10/7	6
	E-83	2	5	2	6/12-10/7	4
T4	E-73	3	5	3	6/12-10/7	6
T6	E-42	3	5	3	6/12-10/7	6
	E-51	3	5	3	6/12-10/7	6
	E-21	3	5	3	6/12-10/7	6
	E-91	3	5	3	6/12-10/7	6
	E-92	3	5	3	6/12-10/7	6
	E-72	3	5	3	6/12-10/7	6
<b>Total Engines</b>	<b>14</b>	<b>Total Engine Personnel:</b>		<b>41</b>		<b>82</b>
<b>Handcrews</b>						
	C-21	10	5	10	6/12-10/7	21
	C-22	10	5	10	6/12-10/7	21
	C-31	10	5	10	6/12-10/7	21
	C-43	10	5	10	6/12-10/7	21
	C-51	10	5	10	6/12-10/7	21
	C-71	10	5	10	6/12-10/7	21
	C-72	10	5	10	6/12-10/7	21
	C-81	10	5	10	6/12-10/7	21
	C-91	10	5	10	6/12-10/7	21
<b>Total Handcrews</b>	<b>9</b>	<b>Total Handcrew Personnel:</b>		<b>90</b>		<b>189</b>
<b>Prevention Techs</b>						
<b>Dry</b>	Chelan	1	5	1	6/12-10/7	
<b>Wet</b>	Methow	1	5	1	6/12-10/7	1.5
	Entiat	1	5	1	6/12-10/7	1.5
	Wen. Rvr./Lake	1	5	1	6/12-10/7	1.5
	Wen. Rvr./Leav.	1	5	1	6/12-10/7	1.5
	Tonasket	1	5	1	6/12-10/7	1.5
	Cle Elum	1	5	1	6/12-10/7	1.5
	Naches	1	5	1	6/12-10/7	1.5
<b>Total Prev. Techs</b>		<b>Total Prevention Personnel:</b>		<b>8</b>		<b>10.5</b>

Table 4.49. Okanogan – Wenatchee National Forest 2006 Resource List.

Resource Type	Resource Designator	Daily Staffing # (personnel/day)	Effective # days/week	Total personnel for coverage	Dates available	Firefighter Production Capacity
Dozers						
Total Dozers		Total Dozer Personnel:		0		
Water Tenders						
Total WTs		Total Water Tender Personnel:		0		
SEATS						
Total SEATs		Total SEAT Personnel:				
Helicopters						
Total Helicopters		Total Helicopter Personnel:		0		
Program Leadership	District/Zone	Positions				
	Tonasket	FMO, AFMO		2	1/1-12/31	
	Methow	FMO, AFMO, Suppression Spec.		2	1/1-12/31	
	Chelan	FMO, AFMO		2	1/1-12/31	
	Entiat	FMO, AFMO		2	1/1-12/31	
	Wenatchee Rvr.	FMO, 2 AFMOs		3	1/1-12/31	
	Cle Elum	FMO, AFMO		2	1/1-12/31	
	Naches	FMO, AFMO		2	1/1-12/31	
	S.O.	FMO, Dep. FMO, Fire Ecol., Fire/Fuels Planner, Trng./Prev. Officer (Acting), Aviatn. Officer, Fire Planner		7		
Total Leadership		Total Leadership Personnel:		22		
TOTAL WFPR PERSONNEL				161		
List National Shared Resources Below:						
Entiat IHC		20	5	20	5/21-10/7	
North Cascades Smokejumpers		16	7	22	5/25-9/22	
Wenatchee Valley Rappellers T2 Natl. Helicopter		6	7	9	7/1-8/29	

**Table 4.49. Okanogan – Wenatchee National Forest 2006 Resource List.**

<b>Resource Type</b>	<b>Resource Designator</b>	<b>Daily Staffing # (personnel/day)</b>	<b>Effective # days/week</b>	<b>Total personnel for coverage</b>	<b>Dates available</b>	<b>Firefighter Production Capacity</b>
Wenatchee Valley Rappellers T2 Reg. Helicopter		9	7	13	6/1-9/28	5
Wenatchee Cache		3	5	3	5/1-10/31	
Moses Lake ATB		2	7	3	5/1-10/31	
				<b>70</b>		<b>5</b>
				<b>Grand Total FFPC</b>		<b>286.5</b>

## **4.10 Issues Facing Okanogan County Fire Protection**

### **4.10.1 Wildland Fire Suppression Mobility**

An important factor in fire suppression is mobility. The ability to transport personnel and equipment to and from the incident is essential for firefighting safety and efficiency. Portions of the topography of Okanogan County limit access. Some areas are difficult to reach and wildfires will develop before suppression resources arrive. Occasionally, suppression efforts employing defensible roads and topographic breaks as an in-direct strategy are necessary. Making the most of existing road systems is a prudent planning strategy and the effectiveness of those road systems can be maximized if fuel reduction thinning can occur where necessary.

### **4.10.2 Accessibility**

Fire chiefs throughout the County have identified home accessibility issues as a primary concern in some parts of Okanogan County. Many homes and driveways have been constructed without regard to access requirements of large emergency vehicles. Lack of accessibility restricts engagement by fire suppression resources. Adoption and enforcement of the International Fire Code, regarding road and driveway construction standards for fire apparatus would prevent accessibility issues in new developments.

### **4.10.3 Recruitment and Retention, Funding, Equipment Needs, Etc.**

There are a number of pervasive issues that challenge volunteer districts within Okanogan County. A short list of such issues include:

- Low tax base funding,
- Recruitment and retention of volunteers,
- Lack of funding for equipment needs, and
- Increases in training requirements.

The members of all fire protection districts should be recognized for the dedication they have shown and the excellent level of protection they provide for residents throughout the County. Volunteers take time out of their lives every day in order to assure the safety of the community.

The demands on volunteer departments are considerable. Keeping pace with ever-increasing training requirements can lead to burn-out of volunteers who are scantily compensated for their

time and efforts. Keeping pace with the growing needs of the communities the districts serve is a constant challenge as well. Although there are some potential funding sources available for local districts to acquire equipment and other needs, grant writing and chasing of funding sources takes considerable time and effort. Recommendations that can help to reduce these challenges will be presented in the Chapter 5:

#### **4.10.4 Road Signage and Rural Addressing**

The ability to quickly locate a physical address is critical in providing services in any type of emergency response. Accurate road signage and rural addressing is fundamental to assure the safety and security Okanogan County residents. Currently, there are numerous areas throughout the County lacking road signs, rural addresses, or both. Signing and addressing throughout the County needs to be brought up to NFPA code in order to assure visibility and quick location.

### ***4.11 Current Wildfire Mitigation Activities in Okanogan County.***

#### **4.11.1 North Central Washington Prescribed Fire Council**

The North Central Washington Prescribed Fire Council, a network of Forest Service, DNR, local fire districts, Nature Conservancy, Okanogan County Cattlemen's Association, Okanogan County Conservation District, Natural Resource Conservation Service, and interested landowners, is patterned after councils in Florida that encourage prescribed burning and help manage them by training and certifying burn managers and changing liability laws. This newly formed council of prescribed fire specialists and interested parties met for the first time in October of 2006 to begin identifying priority areas for prescribed burning throughout Okanogan County and the rest of north central Washington.

#### **4.11.2 Havillah Community Wildfire Protection Plan**

The Havillah community is an unincorporated area in the northeast corner of Okanogan County. There are no Rural Fire Districts within the area covered by this Wildfire plan. The area has a history of large wildfires which have burned numerous residences and structures in the vicinity, destroyed private and public timber stands and damaged crops and grazing acreage. The fires generally have had a negative economic and social impact on the area. The residents of the area felt that creating and adopting this community wildfire plan will help them deal with fire issues on private land in the area, and help them influence neighboring public agencies to reduce fire risks that exist on the neighboring public lands. Due to the nature of large wild land fires which have occurred in the area. It is evident that private land owners and government agencies such as the US Forest Service and Washington State DNR must work in a cooperative manner to reduce the risk of large destructive fires as well as working cooperatively in the suppression of wildfires when they occur.

This plan has been created collaboratively by a small team of local residents. It incorporates ideas, comments, advice and input from other local residents. The process for development of this plan included of meetings and discussions with a variety of local residents, various groups, and sharing the plan with area government agency representatives to obtain their input and advice. The plan will be updated and modified in this same manner as necessary.

#### **4.11.3 Fire Reporting**

The success of the Enhanced – 911 (E-911) emergency reporting system can be measured by the frequency that fire calls route to the County emergency centers. Some wildland firefighting



agencies maintain direct Forest Fire Reporting numbers, but the bulk of fire reports go to the Communication Centers.

When a fire call comes into Okanogan County E-911 Communication Center the local fire protection districts are paged out to respond. Then the Communication Center staff calls the appropriate wildland agency (usually Washington DNR) and relays the fire report info along with the reporting party's phone number.

Fire Reporting Numbers:

- Okanogan County - 911
- WA DNR 1-800-562-6010
- Mount Tolman Fire Center 1-509-634-3100
- USFS Methow Ranger District 1-509-996-4003
- USFS Tonasket Ranger District 1-509-486-2186

#### **4.11.4 Pine Forest Community Wildfire Protection Plan**

Citizens in the Pine Forest Development of Okanogan County have been concerned about the effects of wildfire since their beginning in the early 1970's. This concern was amplified in 1995 when the Fire District, Department of Natural Resources and Forest Service conducted a fire simulation exercise that showed lives and the entire community would be lost during the simulated fire. Increased awareness and recent frequent fires in the Methow Valley provide the catalyst for reducing the fire risk. Pine Forest was the first community to address the fire risk conditions in the Methow Valley.

The Pine Forest Owners Association (PFOW), the association management body, took action in 1998 to develop a Forest Stewardship Plan to address the fuels loading and forest health conditions, starting with the community greenbelt areas. Initial treatments were commercial thinning, removing ladder fuels and hand piling and burning.

This was followed by three National Fire Program grants, totaling nearly \$100,000, in 2001 and 2002 to continue the program. These funds provided for increased awareness and support for the program and fuels treatment on about 150 high priority acres, about 30% of the development. Current grants will complete the risk assessments, complete development of local CWPP, and treatment of an additional 70 acres. But blocks of high-risk fuels will remain and the community desires to continue the program. Lack of safe ingress/egress continues to be a major concern.

#### **4.11.5 Burn Permitting**

Washington State Department of Natural Resources is the prime agency issuing burn permits in Okanogan County. Colville BIA issues burn permits for DNR on "Fee Lands" on the Colville Confederated Tribes. Washington DNR burn permits regulate silvicultural burning.

Washington DNR has a general burning period referred to as "Rule Burn" wherein a written burn permit is not required in LOW to some MODERATE Fire Dangers.

The timeframes for the Rule Burns are from October 16<sup>th</sup> to June 30<sup>th</sup>. Washington DNR allows for Rule Burns to be ten foot (10') piles of forest, yard and garden debris. From July 1<sup>st</sup> to October 15<sup>th</sup>, if Rule Burns are allowed at all, they are limited to four foot (4') piles.

The restrictions for the Rule Burns are:

- Before conducting the burn, permittee must check with the Washington DNR toll free burn number – 1-800-323-BURN (2876);

- Permittee must call Okanogan County Sheriff Department at the Communication Center business number and report where and when they will be burning and that they are able to meet all restrictions and conditions of the Rule Burn;
- All burns must have landowner permission;
- Permittee must be able to control the fire at all times;
- Do not burn in windy days;
- Burn must be attended by a person capable of extinguishing the fire at all times;
- Only one pile to be burned at a time;
- An area cleared to mineral soil at least two feet wide needs to surround the burn pile;
- A charged hose or dedicated fire bucket with a shovel or other firefighting handtool must be present at the burn;
- Fire must be completely extinguished before burner leaves the scene of the fire;

#### Fire Restriction Information Numbers:

- WA DNR– 1-800-323-BURN (2876)
- Okanogan County E-911 Communication Center (Sheriff's Office) 1-509-422-7217 or 1-800-572-6604
- Mount Tolman Fire Center 1-509- 634-3100

The issues associated with debris burning during certain times of the year are difficult to negotiate and enforce. However, there are significant risks associated with the use of fire adjacent to expanses of flammable vegetation under certain scenarios. The Washington State Department of Ecology regulates all types of outdoor burning except silvicultural burning which is regulated by Washington State Department of Natural Resources. Burn permits must be obtained from the Department of Ecology for any type of agricultural burning or burning associated with land clearing. Other types of burning, such as fire training or habitat enhancement, may require a special permit. In addition, those who have obtained a permit are only allowed to burn on designated burn days. In order to find out if it is legal to burn in a specific area, permit holders must call the Department of Ecology hotline, 1-800-406-5322, and their local fire departments for an official "okay".

#### **4.11.6 Methow Community Wildfire Protection Plan**

This Community Wildfire Protection Plan for the Methow Valley watershed of North Central Washington is the result of three years of voluntary collaborative work among no fewer than fifty individuals, representing approximately 24 agencies, fire districts, non-governmental organizations, businesses and community members. In a region renowned for contentious planning processes and controversial natural resource issues, this group's efforts serve as testimony that common objectives can produce effective results among even the most diverse participants.

The Plan is intended to operate as a work in progress, and to inform other planning efforts that address land use and natural resource planning by providing the most current information available concerning wildfire risk mitigation activities affecting public and private lands in the Methow Valley. The Plan will be an integral component to the Okanogan County CWPP.

Because risk mitigation, fuels reduction and ecosystem restoration needs change over time, planning, prioritization and monitoring must be ongoing across ownerships. The Plan is intended to be regularly updated and maintained through the collaborative framework initially established with the Methow Community Fire Plan Coordinating Group and the Okanogan County Fire Plan Steering Committee. Hard copies and electronic files that have been used to create and update this Plan from 2003 to the present will be archived at the Methow Conservancy.

#### **4.11.7 Tunk Valley Grange Wildfire Committee**

Residents in the Tunk Valley have recently formed a wildfire committee to deal with the escalating wildfire situation in the Tunk Valley area. To this end, members of the committee have begun compiling a written assessment of the valley and toured the area with the Washington Department of Natural Resources to broaden their fire knowledge and incorporate the DNR into their planning schemes. They have also held a community meeting with help from the DNR and the FIREWISE program to provide educational materials and prevention information to residents in the area. Recently, individual members of the Tunk Valley committee purchased a 2.6 acre parcel on Tunk Creek that they hope to use as the future site of a Tunk Valley Fire Station.

#### **4.11.8 Edelweiss Community Wildfire Protection Plan**

Citizens in the Edelweiss Development of Okanogan County have been concerned about the effects of wildfire since their beginning in the early 1970's. The community was placed on a Level II Evacuation Order during the Whiteface Fire in 1994. The Fawn Peak Fire, recent major fires in the Pasayten Wilderness, and in the Chewuch Drainage keep this concern alive. The 2003 Needles Fire, that threatened the entire upper Methow Valley, provided another scare, evacuation alert and increased emphasis for fire safety. The Edelweiss Maintenance Commission (EMC), the association management body, took action in 2001 and applied for a National Fire Plan grant. They were successful in acquiring a \$145,700 grant to conduct a "Fire Wise" workshop and risk assessments, to develop a Community Wildfire Protection Plan, to develop a fuel break along the Goat Creek Road and begin fuels treatment on demonstration lots and on the first bench. In 2002 the grant was amended to add \$300,050 to continue additional fuels treatments. These funds have provided for increased awareness and support for the program and fuels treatment on 134 high priority acres, on about 25% of the development. But blocks of high-risk fuels still exist and the community desires to continue the program.

#### **4.11.9 Multi-Jurisdictional Mutual Aid Agreements**

Currently the cities, towns, fire protection districts, and wildland fire agencies within Okanogan County have extensive mutual aid agreements that serve to increase the protection and effectiveness of all Okanogan County fire response jurisdictions. Municipal and County fire departments in Okanogan County provide mutual aid for each other to the fullest extent possible. Each Okanogan County Fire District has the opportunity for a suppression agreement with the Washington State Department of Natural Resources. The agreement with the DNR allows for an Okanogan County Fire District to provide fire protection services to an area within the jurisdiction of the DNR located within the district and for the District to contract with the DNR to assist in fire protection services (on a limited basis) on forest land within the District's jurisdiction. In a separate mutual aid agreement with the Bureau of Indian Affairs, some Okanogan County Fire Districts have agreed to provide fire protection services to an area within the jurisdiction of BIA Fire Management and located in or adjacent to a fire district and on Trust Lands and Forest Fire Protection Assessment lands within District jurisdiction. Additionally, the Okanogan Fire Chiefs Association has agreements with the Okanogan and Wenatchee National Forests and the Washington DNR to use these agency's radio frequencies to facilitate forestry activities or to respond to emergencies. These agreements significantly improve the capabilities and effectiveness of any and all individual fire departments as well as provide assistance to the DNR, BIA, and USFS wildland fire departments. Not only does this improve the safety of Okanogan County residents, structures, infrastructure, and lands, but it also facilitates good interdepartmental working relationships.

## **Chapter 5: Treatment Recommendations**

### **5 Administration & Implementation Strategy**

Critical to the implementation of this Community Wildfire Protection Plan will be the identification of, and implementation of, an integrated schedule of treatments targeted at achieving a reduction in the number of human caused fires and overall impact of wildland fires on Okanogan County. As there are many land management agencies and thousands of private landowners in Okanogan County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across all ownerships.

Okanogan County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

The land management agencies in Okanogan County, specifically the USDA Forest Service, the State, and the Confederated Tribes of the Colville Reservation, are participants in this planning process and have contributed to its development. Where available, their schedule of land treatments have been considered in this planning process to better facilitate a correlation between their identified planning efforts and the efforts of Okanogan County.

All risk assessments were made based on the conditions existing during 2006, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the County's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

#### **5.1 Monitoring and Maintenance**

As part of the policy of Okanogan County in relation to this planning document, this entire All Hazard Mitigation Plan should be reviewed annually (from date of adoption) at a special meeting of the planning committee, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. The Okanogan County Emergency Manager (or an official designee of the Okanogan County Commissioners) is responsible for the scheduling, publicizing, and leadership of the annual review meeting. During this meeting, participating jurisdictions will report on their respective projects and identify needed changes and updates to the existing plan. Maintenance to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the All Hazard Mitigation Plan. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

#### **5.2 Prioritization of Mitigation Activities**

The prioritization process will include a special emphasis on benefit-cost analysis review. The process will reflect that a key component in any funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by County and local jurisdictions with overall coordination provided by the County Emergency Manager.

County Commissioners and the elected officials of all jurisdictions will evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where existing funds, staffing, and resources are available and there is community interest in implementing mitigation

measures. If no federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that the County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. The County will consider all pre-disaster mitigation proposals brought before the County Commissioners by department heads, city officials, fire districts and local civic groups.

When federal or state funding is available for hazard mitigation, there are usually requirements that establish a rigorous benefit-cost analysis as a guiding criterion in establishing project priorities. The County will understand the basic federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects. FEMA's three grant programs (the Post-Disaster Hazard Mitigation Grant Program, the Pre-Disaster Flood Mitigation Assistance and Pre-Disaster Mitigation grant programs) that offer federal mitigation funding to state and local governments all include the benefit-cost and repetitive loss selection criteria.

The prioritization of new projects and deletion of completed projects will occur annually and be facilitated by the County Emergency Manager to include the County Commissioner's Office, City Mayors and Councils, Fire District Chiefs and Commissioners, agency representatives (USFS, WA DNR, etc.), and other community organizations. All mitigation activities, recommendations, and action items mentioned in this document are dependent on available funding and staffing. The prioritization of projects will be based on the selection of projects which create a balanced approach to mitigation which recognizes the hierarchy of treating in order (highest first):

- People
- Infrastructure
- Local and Regional Economy
- Traditional Way of Life
- Ecosystems

## **5.2.1 Prioritization Scheme**

A numerical scoring system is used to prioritize projects. This prioritization serves as a guide for the County when developing mitigation activities. This project prioritization scheme has been designed to rank projects on a case by case basis. In many cases, a very good project in a lower priority category could outrank a mediocre project in a higher priority. The County mitigation program does not want to restrict funding to only those projects that meet the high priorities because what may be a high priority for a specific community may not be a high priority at the County level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the County and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been developed. Any type of project, whether County or site specific, will be prioritized in this more formal manner.

To prioritize projects, a general scoring system has been developed. This prioritization scheme has been used in statewide all hazard mitigations plans. These factors range from benefit-cost ratios, to details on the hazard being mitigated, to environmental impacts.

Since planning projects are somewhat different than non-planning projects when it comes to reviewing them, different criteria will be considered, depending on the type of project.

The factors for the non-planning projects include:

- Benefit / Cost
- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development
- Potential project effectiveness and sustainability

The factors for the planning projects include:

- Benefit / Cost
- Vulnerability of the community or communities
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development

Since some factors are considered more critical than others, two ranking scales have been developed. A scale of 1-10, 10 being the best, has been used for cost, population benefit, property benefit, economic benefit, and vulnerability of the community. Project feasibility, hazard magnitude/frequency, potential for repetitive loss reduction, potential to mitigate hazards to future development, and potential project effectiveness and sustainability are all rated on a 1-5 scale, with 5 being the best. The highest possible score for a non-planning project is 65 and for a planning project is 30.

The guidelines for each category are as follows:

#### **5.2.1.1 Benefit / Cost (BC)**

The analysis process will include summaries as appropriate for each project as well as benefit / cost analysis results. Projects with a negative BC analysis result will be ranked as a 0. Projects with a positive BC analysis will receive a score equal to the projects BC analysis results divided by 25. Therefore a project with a BC ratio of 125:1 would receive 5 points, a project with a BC ratio of 250:1 (or higher) would receive the maximum points of 10.

FEMA Requirement §201.4(c)(4)(iii) details criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, the requirement states that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a BC review of proposed projects and their associated costs. For many of the initiatives identified in this plan, the County may seek financial assistance under FEMA's HMGP or PDM programs. Both of these programs require detailed BC analysis as part of the FEMA award process. Okanogan County is committed to implementing mitigation strategies with benefits which exceed costs. For projects which do not require financial assistance from grant programs that require this type of analysis, the County reserves the right to define "benefits" according to parameters that would otherwise be considered subjective, while still meeting the needs and goals of the plan.

#### **5.2.1.2 Population Benefit**

Population benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (County,

city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

#### **5.2.1.3 Property Benefit**

Property benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save \$100,000,000 or more in losses. Property benefit of less than \$100,000,000 will receive a score of the benefit divided by \$100,000,000, times 10 (for property benefits below \$100 million). Therefore, a property benefit of \$20,000,000 would receive a score of 2 ( $[20,000,000 \div 100,000,000] \times 10 = 2$ ). In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

#### **5.2.1.4 Economic Benefit**

Economic benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 10 would prevent a total economic collapse, a ranking of 5 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

#### **5.2.1.5 Vulnerability of the Community**

For planning projects, the vulnerability of the community is considered. A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote planning participation by the smaller or less vulnerable communities in the state, the score will be based on the other communities being considered for planning grants. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

#### **5.2.1.6 Project Feasibility (Environmentally, Politically & Socially)**

Project feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

#### **5.2.1.7 Hazard Magnitude/Frequency**

The hazard magnitude/frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that

event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 5, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

#### **5.2.1.8 Potential for repetitive loss reduction**

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 5. Those that do not address repetitive losses receive a rating of 1.

#### **5.2.1.9 Potential to mitigate hazards to future development**

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the County will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

#### **5.2.1.10 Potential project effectiveness and sustainability**

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

#### **5.2.1.11 Final ranking**

Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranked high, medium, or low based on the thresholds of:

Project Ranking Priority Score Non-Planning Projects

- High 40-65
- Medium 25-39
- Low 1-24

Project Ranking Priority Score Planning Projects

- High 18-30
- Medium 12-17
- Low 1-11

### **5.3 Possible Wildfire Mitigation Activities**

As part of the implementation of wildfire mitigation activities in Okanogan County, a variety of management tools may be used. Management tools include but are not limited to the following:



- Homeowner and landowner education
- Policy changes for structures and infrastructure in the Wildland Urban Interface
- Home site defensible zone through fuels modification
- Community defensible zone through fuels alteration
- Access improvements
- Emergency response enhancements (training, equipment, locating new fire stations, new fire districts)
- Regional land management recommendations for private, state, and federal landowners

Maintaining private property rights will continue to be one of the guiding principles of this plan's implementation. Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

## 5.4 Safety & Policy

Wildfire mitigation efforts must be supported by a set of policies and regulations at the County level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related in nature and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

**Table 5.1. Action Items in Safety and Policy.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.1.a: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction.</b>	<b>Protection of people and structures</b> by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas.  <div>Priority: High</div>	<b>Lead:</b> County Commissioner's Office  <b>Support:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where juxtaposed near heavy wildland fuels.
<b>5.1.b: Begin distributing "Code of the New West"-type pamphlets with building permit requests.</b>	<b>Protection of people and structures</b> by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas.  <div>Priority: Medium</div>	<b>Lead:</b> County Building Department  <b>Support:</b> County Commissioners and incorporated cities of Oroville, Tonasket, Riverside, Omak, Okanogan, Conconully, Nespelem, Elmer City, Coulee Dam, Brewster, Pateros, Twisp, and Winthrop.	Year 1 (2007): Obtain copyrights to "New Code of the West" pamphlet.  Year 1 (2007): Distribute pamphlets.

**Table 5.1. Action Items in Safety and Policy.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.1.c: Rural signage (road signs &amp; house numbers) improvements across the County.</b>	<b>Protection of people, structures, and infrastructure</b> by improving the ability of emergency services personnel, residents, and visitors to navigate roads. <div>Priority: Medium</div>	<b>Lead:</b> County Building Department <b>Support:</b> County Planning Department and County Commissioners	Can be completed during year 1 (2007) pending funding to implement the project. Estimate \$60,000 for signs and posting.
<b>5.1.d: Develop policy on requiring new home and business construction to install underground power lines.</b>	<b>Protection of people and structures</b> by reducing the risk of wildfire ignitions. <div>Priority: High</div>	<b>Lead:</b> County Planning Department <b>Support:</b> County Commissioner's Office, Okanogan County Public Utilities District, and utilities companies.	Year 1 (2007): Implement a policy to require new utility lines to be buried underground. Year 1 (2007): Collaborate with Okanogan County Public Utilities District and local utility companies to implement this policy.
<b>5.1.e: Develop a policy to enforce burning permits and fire restrictions throughout the County.</b>	<b>Protection of people and structures</b> by reducing the fire ignition risk in high-risk areas. <div>Priority: High</div>	<b>Lead:</b> County Commissioners <b>Support:</b> City and County Planning Departments, Okanogan County Sheriff's Department, DNR, incorporated cities of Oroville, Tonasket, Riverside, Omak, Okanogan, Conconully, Nespelem, Elmer City, Coulee Dam, Brewster, Pateros, Twisp, and Winthrop, and local communities.	Year 1 (2007): Consider and develop policy to address burn permit system and enforcement to help reduce the number of accidental wildfire ignitions.
<b>5.1.f: Develop policy on adoption of International Fire Code.</b>	<b>Protection of people and structures</b> by improving the ability of emergency services personnel to safely and effectively respond to home fires. <div>Priority: High</div>	<b>Lead:</b> County Commissioner's Office <b>Support:</b> County Planning Department, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Consider and develop policy to adopt the International Fire Code regulations adopted by the State of Washington.
<b>5.1.g: Continue development, support of, and funding for the North Central Washington Prescribed Fire Council.</b>	<b>Protection of people and structures</b> by improving the condition of forest and rangelands in Okanogan County through active management. <div>Priority: High</div>	<b>Lead:</b> North Central Washington Prescribed Fire Council <b>Support:</b> County Commissioner's Office, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, City of Okanogan Fire Department, USFS, DNR, Nature Conservancy, Okanogan County Cattleman's Association, Okanogan Conservation District, NRCS, and interested landowners.	Year 1 (2007): Continue development of newly formed North Central Washington Prescribed Fire Council. Ongoing: Continue providing funding for the management of the Council and support for future projects identified by the multi-jurisdictional committee.

**Table 5.1. Action Items in Safety and Policy.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.1.h: Incorporate this Community Wildfire Protection Plan into the Public Utility District's Emergency Preparedness and Contingency Plan.</b>	<b>Protection of people and structures</b> by dovetailing this planning process with other organizations emergency operating plans.  Priority: High	<b>Lead:</b> Okanogan County Public Utility District	Year 1 (2007): Update Emergency Plan to incorporate the Community Wildfire Protection Plan.
<b>5.1.i: Incorporate the Okanogan County Community Wildfire Protection Plan into the Okanogan County Comprehensive Plan, where applicable.</b>	<b>Protection of people and structures</b> by dovetailing this planning process with other County planning documents.  Priority: High	<b>Lead:</b> Okanogan County Commissioners <b>Support:</b> Okanogan County Planning Department.	Ongoing: Incorporate the goals and projects outlined in this plan into the updated Comprehensive Plan.
<b>5.1.j: Adopt stringent regulations to insure fire-safe development of rural subdivisions (see FIREWISE or similar programs for specific recommendations).</b>	<b>Protection of people and structures</b> by improving the ability of emergency services personnel to safely and effectively respond to home fires and decrease the overall fire risk in wildland urban interface areas.  Priority: High	<b>Lead:</b> County Planning Department <b>Support:</b> County Commissioner's Office, County Building Department, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Condonully Fire Department, City of Omak Fire Department, City of Okanogan Fire Department, developers, and interested residents.	Year 1 (2007): Research fire-safety related programs such as FIREWISE to determine specific recommendations for policy changes regarding development of rural subdivisions. Year 2 – 3 (2008 – 2009): Begin gathering public support of new regulations. Produce and submit necessary documentation to facilitate County adoption of recommended regulations.

## 5.5 People and Structures

The protection of people and structures will be tied together closely as the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire. The other incident is a firefighter who suffers the loss of life during the combating of a fire. Many of the recommendations in this section will define a set of criteria for implementation while others will be rather specific in extent and application.

Many of the recommendations in this section involve education and increasing awareness of the residents of Okanogan County. These recommendations stem from a variety of factors including items that became obvious during the analysis of the public surveys, discussions during public meetings, and observations about choices made by residents living in the Wildland-Urban Interface. Over and over, the common theme was present that pointed to a situation of landowners not recognizing risk factors:

- Fire District personnel pointed to numerous examples of inadequate access to homes of people who believe they have adequate ingress.
- Discussions with the general public indicated an awareness of wildland fire risk, but they could not generally identify risk factors.
- A large number of the respondents to the public mail survey (48%) indicated that they want to participate in educational opportunities focused on the WUI and what they can do to increase their home's chances of surviving a wildfire.

Residents and policy makers of Okanogan County should recognize certain factors that exist today, that in their absence would lead to an increase in the risk factors associated with wildland

fires in the WUI of Okanogan County. The items listed below should be encouraged, acknowledged, and recognized for their contributions to the reduction of wildland fire risks:

**Livestock Grazing** in and around the communities of Okanogan County has led to a reduction of many of the fine fuels that would have been found in and around the communities and in the wildlands of Okanogan County. Domestic livestock not only eat these grasses, forbs, and shrubs, but they also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing additional sets of eyes into the forests and rangelands of the County where they may observe ignitions, or potentially risky activities. Livestock grazing in this region should be encouraged in the future as a low cost, positive tool of wildfire mitigation in the Wildland-Urban Interface and beyond.

**Forest Management** in Okanogan County has been greatly affected by the reduction of operating sawmills in the region. The forest management programs of the U.S. Forest Service and the Washington Department of Natural Resources in the region has led to some reduction of wildland fuels where they are closest to homes and infrastructure; however, there is significant room for growth in these agency's fuels reduction programs. The Confederated Tribes of the Colville Reservation as well as many private and industrial forest landowners have implemented very active forest management programs that are leading to a significant decrease in high risk fuels. Furthermore, forests are dynamic systems that will never be completely free from risk. Treated stands will need repeated treatments to reduce the risk to acceptable levels in the long term. Okanogan County, as well as several other organizations and agencies, is currently considering using prescribed fire as a management tool to reduce hazardous fuels on their lands.

**Agriculture** is a significant component of Okanogan County's economy. Much of the rangeland interface is made up of a mosaic of agricultural crops, even extending to the forestland interface. The original conversion of these lands to agriculture from rangeland and forestland, was targeted at the most productive soils and juxtaposition to water. Many of these productive rangeland ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is much of the landscape historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Okanogan County is integral to the continued management of wildfire risk in this region.

**Salvage Logging** after a wildfire event can help capture some of the burned over timber's economic value if implemented immediately after the wildfire event. Additionally, the removal of dead or dying trees can help lessen the forest's subsequent attack by insects. Salvage logging, if done responsibly, can be effective in accomplishing both the economic goals of the administrating party as well as help reduce fuel loads in high risk areas.

**Prescribed Fire** can be used as a tool in forest and rangeland management programs to accomplish several goals. Prescribed fire, when done correctly and in appropriate areas, can help reduce hazardous fuel loads. Prescribed fire has also been used to prepare sites for seeding or planting, improve wildlife habitat, manage competing vegetation, control insects and disease, improve forage for grazing, enhance appearance, and improve access.

**Table 5.2. Action Items for People and Structures.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.2.a: Implementation of Youth and Adult Wildfire Educational Programs.</b>	<p><b>Protect people and structures</b> by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk.</p> <p>Priority: High</p>	<p>Cooperative effort including:</p> <ul style="list-style-type: none"> <li>• North Central Washington Prescribed Fire Council</li> <li>• Washington Department of Natural Resources</li> <li>• State and Private Forestry Offices</li> <li>• Bureau of Land Management</li> <li>• Bureau of Indian Affairs</li> <li>• USDA Forest Service</li> <li>• Local School Districts</li> <li>• Local Non-governmental Community Organizations</li> <li>• Local Fire Districts and Departments in Okanogan County</li> <li>• Incorporated cities of Oroville, Tonasket, Riverside, Omak, Okanogan, Conconully, Nespelem, Elmer City, Coulee Dam, Brewster, Pateros, Twisp, and Winthrop and communities of Okanogan County</li> </ul>	<p>To start immediately using existing educational program materials and staffing (e.g. Forest Stewardship class offered by Washington State University). Formal needs assessment should be the responsibility of WSU Extension and include the development of an integrated WUI educational series by year 2 (2008). Costs initially to be funded through existing budgets for these activities to be followed with grant monies to continue the programs as identified in the formal needs assessment.</p>
<b>5.2.b: Wildfire risk assessments of homes in identified neighborhoods.</b>	<p><b>Protect people and structures</b> by increasing awareness of specific risk factors of individual home sites in the at-risk landscapes. Only after these are completed can home site treatments follow.</p> <p>Priority: High</p>	<p><b>Lead:</b> County Emergency Manager and Washington DNR</p> <p><b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.</p> <p>Actual work may be completed by Wildfire Mitigation Consultants.</p>	<p>Cost: Approximately \$100 per home site for inspection, written report, and discussions with the homeowners.</p> <p>There are approximately 54,185 parcels in Okanogan County, roughly 10,837 (20%) of these structures would benefit from a home site inspection and budget determination for a total estimate of \$1,083,700.</p> <p>Action Item: Secure funding and contract to complete the inspections during years 1 &amp; 2 (2007-08)</p> <p>Home site inspection reports and estimated budget for each home site's treatments will be a requirement to receive funding for treatments through grants.</p>

**Table 5.2. Action Items for People and Structures.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.2.c: Home site defensible space treatments.</b>	<p><b>Protect people, structures, and increase firefighter safety</b> by reducing the risk factors surrounding homes in the WUI of Okanogan County.</p> <div>Priority: Medium</div>	<p><b>Lead:</b> County Emergency Manager and Washington DNR</p> <p><b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.</p> <p><i>Complete concurrently with 5.2.b.</i></p>	<p>Actual cost level will be based on the outcomes of the home site assessments.</p> <p>Estimate that treatments in rangelands will cost approximately \$750 per home site for a defensible space of roughly 150'. Estimate that treatments in forestland will cost roughly \$1,000 per home site for a defensible space of about 200'. Approximately 8,128 home site treatments (75% of those assessed) throughout the County would add up to an estimated cost of \$7,518,500 (70% forestland and 30% rangeland).</p> <p>Home site treatments can begin with the securing of funding for the treatments and immediate implementation in 2006 and will continue from year 1 through 5 (2011).</p>
<b>5.2.d: Community defensible zone treatments in rural subdivisions or housing clusters.</b>	<p><b>Protect people, structures, and increase firefighter safety</b> by reducing the risk factors surrounding high risk communities in the WUI of Okanogan County.</p> <div>Priority: Medium</div>	<p><b>Lead:</b> County Emergency Manager and Washington DNR</p> <p><b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.</p>	<p>Actual funding level will be based on the outcomes of the home site assessments and cost estimates.</p> <p>Years 2-5 (2008-11): Treat high risk wildland fuels from home site defensible space treatments to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist near homes and infrastructure. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented.</p> <p>Approximate average cost on a per parcel basis is \$2,800 (average 4 acres per home) depending on extent of home defensibility site treatments, estimate 4,064 homes (50% of treated homes) in need of this type of treatment for a cost estimate of \$11,379,200.</p>
<b>5.2.e: Maintenance of home site defensible space treatments.</b>	<p><b>Protect people, structures, and increase firefighter safety</b> by reducing the risk factors surrounding homes in the WUI of Okanogan County.</p> <div>Priority: Medium</div>	<p><b>Lead:</b> County Emergency Manager and Washington DNR</p> <p><b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.</p>	<p>Home site defensibility treatments must be maintained periodically to sustain benefits of the initial treatments.</p> <p>Each site should be assessed 5 years following initial treatment</p> <p>Estimated re-inspection cost will be \$500 per home site on all sites initially treated or recommended for future inspections (\$4,064,000).</p> <p>Follow-up inspection reports with treatments as recommended years 5 through 10 (2011-2016).</p>

**Table 5.2. Action Items for People and Structures.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.2.f: Re-entry of home site defensible space treatments.</b>	<b>Protect people, structures, and increase firefighter safety</b> by reducing the risk factors surrounding homes in the WUI of Okanogan County.  <div>Priority: Medium</div>	<b>Lead:</b> County Emergency Manager and Washington DNR  <b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.	Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.
<b>5.2.g: Development of community evacuation plans and alternate safety zones for residents in Tunk Valley, Chilliwist Valley, Mount Hull, Conconully, Aeneas Valley, Lost River, Edelweiss, Pine Forest, Twisp River, Libby Creek, French Creek, Alta Lake, Limebelt, Hoot N Holler, Upper Rendezvous, Gold Creek, Black Canyon Creek, McFarland Creek, Squaw Creek, and Wannacut communities.</b>	<b>Protect people, structures, and increase firefighter safety</b> by directly increasing the safety of residents and visitors during a wildfire evacuation situation.  <div>Priority: Medium</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, community residents, local non-governmental community organizations, USFS, DNR, BIA, and BLM.	Year 1 (2007): Develop safe evacuation plans including alternate routes and safety zones for residents in the identified communities due to limited access points and high fire risk. Send information to residents and hold a public meeting to inform communities.
<b>5.2.h: Implement proposed home defensible space projects.</b>	<b>Protect people, structures, and firefighter safety</b> by decreasing the fire risk around homes and communities.	<b>Lead:</b> County Emergency Manager and Washington DNR  <b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.	Year 1 (2007): Locate funding source and conduct home site evaluations for structures in mapped project areas. Write project plans for individual landowners.  Year 2 (2008): Continue to work with landowners to implement agreed upon project plans.
Defensible Space Project Areas	Acres	Project Cost	Priority Ranking
Aeneas Valley Project Area	46,721	Approximately 595 structures at \$1,000/per structure constitutes an estimated cost of \$595,000.	High
Alder Creek Project Area	2,182	Approximately 28 structures at \$800/per structure constitutes an estimated cost of \$22,400.	Medium
Alta Lake Project Area	1,560	Approximately 76 structures at \$1,000/per structure constitutes an estimated cost of \$76,000.	High
Antoine Creek Project Area	2,961	Approximately 33 structures at \$750/per structure constitutes an estimated cost of \$24,750.	Medium
Bear Creek Project Area	1,709	Approximately 26 structures at \$750/per structure constitutes an estimated cost of \$19,500.	High
Benson Creek Project Area	1,690	Approximately 23 structures at \$850/per structure constitutes an estimated cost of \$19,550.	Medium
Black Canyon Project Area	1,154	Approximately 1 structures at \$1,000/per structure constitutes an estimated cost of \$1,000.	Low
Bonaparte Lake Project Area	1,985	Approximately 31 structures at \$1,000/per structure constitutes an estimated cost of \$31,000.	High



**Table 5.2. Action Items for People and Structures.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
Defensible Space Project Areas	Acres	Project Cost	Priority Ranking
Buzzard Lake Project Area	7,086	Approximately 62 structures at \$950/per structure constitutes an estimated cost of \$58,900.	High
Chilliwist Project Area	5,459	Approximately 76 structures at \$900/per structure constitutes an estimated cost of \$68,400.	High
Conconully Project Area	12,375	Approximately 331 structures at \$1,000/per structure constitutes an estimated cost of \$331,000.	High
Crawfish Lake Project Area	14,448	Approximately 45 structures at \$1,000/per structure constitutes an estimated cost of \$45,000.	High
French Creek Project Area	2,449	Approximately 29 structures at \$950/per structure constitutes an estimated cost of \$27,550.	Medium
Gold Creek Project Area	2,068	Approximately 40 structures at \$1,000/per structure constitutes an estimated cost of \$40,000.	High
Harmony Heights Project Area	4,739	Approximately 37 structures at \$800/per structure constitutes an estimated cost of \$29,600.	Medium
Havillah Project Area	6,382	Approximately 186 structures at \$1,000/per structure constitutes an estimated cost of \$186,000.	High
Hoot N Holler Project Area	970	Approximately 26 structures at \$800/per structure constitutes an estimated cost of \$20,800.	Medium
Hwy 20 Corridor Project Area	29,004	Approximately 182 structures at \$1,000/per structure constitutes an estimated cost of \$182,000.	High
Libby Creek Project Area	9,312	Approximately 44 structures at \$1,000/per structure constitutes an estimated cost of \$44,000.	High
Limebelt Project Area	6,218	Approximately 107 structures at \$900/per structure constitutes an estimated cost of \$96,300.	High
Loomis Project Area	16,945	Approximately 105 structures at \$1,000/per structure constitutes an estimated cost of \$105,000.	High
Lost Lake Project Area	5,938	Approximately 27 structures at \$1,000/per structure constitutes an estimated cost of \$27,000.	Medium
Mazama Project Area	3,709	Approximately 509 structures at \$1,000/per structure constitutes an estimated cost of \$509,000.	High
McFarland Creek Project Area	21,959	Approximately 22 structures at \$1,000/per structure constitutes an estimated cost of \$22,000.	Medium
Mount Hull Project Area	2,377	Approximately 259 structures at \$950/per structure constitutes an estimated cost of \$246,050.	High
Nine Mile Project Area	14,290	Approximately 111 structures at \$850/per structure constitutes an estimated cost of \$94,350.	High
Pine Forest Project Area	14,397	Approximately 46 structures at \$1,000/per structure constitutes an estimated cost of \$46,000.	High
Pontiac Ridge Project Area	2,169	Approximately 125 structures at \$1,000/per structure constitutes an estimated cost of \$125,000.	Medium
Rendezvous Project Area	18,407	Approximately 26 structures at \$900/per structure constitutes an estimated cost of \$23,400.	Medium
Salmon Creek Project Area	6,964	Approximately 61 structures at \$800/per structure constitutes an estimated cost of \$48,800.	High
Squaw Creek Project Area	9,923	Approximately 12 structures at \$1,000/per structure constitutes an estimated cost of \$12,000.	Medium
Texas Creek Project Area	905	Approximately 19 structures at \$800/per structure constitutes an estimated cost of \$15,200.	Medium
Toroda Creek Project Area	3,239	Approximately 130 structures at \$950/per structure constitutes an estimated cost of \$123,500.	High
Twin Creeks Dev. Project Area	31,042	Approximately 213 structures at \$800/per structure constitutes an estimated cost of \$170,400.	High
Twin Lakes Project Area	23,216	Approximately 262 structures at \$800/per structure constitutes an estimated cost of \$209,600.	High
Twisp River Project Area	2,877	Approximately 96 structures at \$1,000/per structure constitutes an estimated cost of \$96,000.	High
Wannacut Project Area	24,220	Approximately 66 structures at \$900/per structure constitutes an estimated cost of \$59,400.	High
Wolf Creek Project Area	8,681	Approximately 76 structures at \$1,000/per structure constitutes an estimated cost of \$76,000.	High



**Table 5.2. Action Items for People and Structures.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.2.i: Implement proposed Community Defensible Zone projects.</b>	<b>Protect people, structures, and firefighter safety</b> by decreasing the fire risk around homes and communities.	<p><b>Lead:</b> County Emergency Manager and Washington DNR</p> <p><b>Support:</b> County Commissioner's, BIA, USFS, Highlands Fire Defense Team, local community organizations, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.</p>	<p>Year 1 (2007): Locate funding source and conduct evaluations. Write project plans for identified community and individual landowners.</p> <p>Years 2-5 (2008-11): Treat high risk wildland fuels from home site defensible space treatments to an area extending beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist near homes and infrastructure. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented.</p>
Community Defensible Zone Project Areas	Total Acres	Project Cost	Priority Ranking
Aeneas Valley Project Area	46,721	Approximately \$600/per acre constitutes an estimated cost of \$28,032,600.	High
Alder Creek Project Area	2,182	Approximately \$500/per acre constitutes an estimated cost of \$1,091,000.	Medium
Alta Lake Project Area	1,560	Approximately \$700/per acre constitutes an estimated cost of \$1,092,316.	High
Antoine Creek Project Area	2,961	Approximately \$500/per acre constitutes an estimated cost of \$1,480,500.	Medium
Bear Creek Project Area	1,709	Approximately \$500/per acre constitutes an estimated cost of \$854,500.	Medium
Benson Creek Project Area	1,690	Approximately \$600/per acre constitutes an estimated cost of \$1,014,000.	Medium
Black Canyon Project Area	1,154	Approximately \$700/per acre constitutes an estimated cost of \$807,800.	Low
Bonaparte Lake Project Area	1,985	Approximately \$700/per acre constitutes an estimated cost of \$1,389,500.	Medium
Buzzard Lake Project Area	7,086	Approximately \$700/per acre constitutes an estimated cost of \$4,960,200.	High
Chilliwist Project Area	5,459	Approximately \$600/per acre constitutes an estimated cost of \$7,425,000.	High
Conconully Project Area	12,375	Approximately \$700/per acre constitutes an estimated cost of \$10,113,600.	High
Crawfish Lake Project Area	14,448	Approximately \$700/per acre constitutes an estimated cost of \$1,714,300.	High
French Creek Project Area	2,449	Approximately \$600/per acre constitutes an estimated cost of \$1,240,800.	Medium
Gold Creek Project Area	2,068	Approximately \$700/per acre constitutes an estimated cost of \$3,317,300.	Medium
Harmony Heights Project Area	4,739	Approximately \$500/per acre constitutes an estimated cost of \$3,191,000.	Medium
Havillah Project Area	6,382	Approximately \$600/per acre constitutes an estimated cost of \$17,402,400.	Medium
Hoot N Holler	970	Approximately \$600/per acre constitutes an estimated cost of \$582,000.	Medium
Hwy 20 Corridor Project Area	29,004	Approximately \$700/per acre constitutes an estimated cost of \$6,518,400.	High
Libby Creek Project Area	9,312	Approximately \$700/per acre constitutes an estimated cost of \$4,352,600.	High
Limebelt Project Area	6,218	Approximately \$600/per acre constitutes an estimated cost of \$10,167,000.	High
Loomis Project Area	16,945	Approximately \$700/per acre constitutes an estimated cost of \$4,156,600.	High
Lost Lake Project Area	5,938	Approximately \$700/per acre constitutes an estimated cost of \$2,596,300.	Medium

**Table 5.2. Action Items for People and Structures.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>Community Defensible Zone Project Areas</b>	<b>Total Acres</b>	<b>Project Cost</b>	<b>Priority Ranking</b>
Mazama Project Area	3,709	Approximately \$700/per acre constitutes an estimated cost of \$15,371,300.	High
McFarland Creek Project Area	21,959	Approximately \$700/per acre constitutes an estimated cost of \$1,663,900.	Medium
Mount Hull Project Area	2,377	Approximately \$600/per acre constitutes an estimated cost of \$8,574,000.	High
Nine Mile Project Area	14,290	Approximately \$500/per acre constitutes an estimated cost of \$7,198,500.	High
Pine Forest Project Area	14,397	Approximately \$700/per acre constitutes an estimated cost of \$1,518,300.	High
Pontiac Ridge Project Area	2,169	Approximately \$700/per acre constitutes an estimated cost of \$12,884,900.	Medium
Rendezvous Project Area	18,407	Approximately \$600/per acre constitutes an estimated cost of \$4,178,400.	Medium
Salmon Creek Project Area	6,964	Approximately \$500/per acre constitutes an estimated cost of \$4,961,500.	High
Squaw Creek Project Area	9,923	Approximately \$700/per acre constitutes an estimated cost of \$633,500.	Medium
Texas Creek Project Area	905	Approximately \$500/per acre constitutes an estimated cost of \$1,619,500.	Medium
Toroda Creek Project Area	3,239	Approximately \$600/per acre constitutes an estimated cost of \$18,625,200.	High
Twin Creeks Development Project Area.	31,042	Approximately \$200/per acre constitutes an estimated cost of \$4,643,200.	High
Twin Lakes Project Area	23,216	Approximately \$500/per acre constitutes an estimated cost of \$1,438,500.	High
Twisp River Project Area	2,877	Approximately \$700/per acre constitutes an estimated cost of \$16,954,000.	High
Wannacut Project Area	24,220	Approximately \$700/per acre constitutes an estimated cost of \$6,076,700.	High
Wolf Creek Project Area	8,681	Approximately \$700/per acre constitutes an estimated cost of \$2,054,500.	High

An overview and regional maps of project areas are available in Appendix I.

## 5.6 Infrastructure

Significant infrastructure refers to the communications, transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region or a surrounding area. All of these components are important to the north central Washington, and to Okanogan County specifically. These networks are by definition a part of the Wildland-Urban Interface in the protection of people, structures, **infrastructure**, and unique ecosystems. Without supporting infrastructure a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and mitigation recommendations.

**Communication Infrastructure:** This component of the WUI seems to be diversified across the County with multiple source and destination points, and a spread-out support network.

**Transportation Infrastructure (road and rail networks):** This component of the WUI has some significant potential limitations in Okanogan County. U.S. Highway 97 and State Routes 20, 153, and 155 are the primary maintained routes linking Okanogan County to other major population centers including Wenatchee, Colville, and Penticton, British Columbia. Thus, a significant amount of interstate and international traffic travels through the County. Also, State Highways 20, 153, and 155 connect the more remote communities with the commercial hubs of Omak, Tonasket, and Winthrop. U.S. Highway 97 also serves as a Port of Entry into British Columbia, Canada. In the event these highways are disabled, access or evacuation to some areas may become limited to seasonally maintained secondary roads or forest routes.

Other roads in the County have limiting characteristics, such as narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to and overtopping some roads. Some of these roads access remote forestland and rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not the priority for treatments in the County. Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the County.

**Energy Transport Supply Systems (gas and power lines):** A number of power lines crisscross Okanogan County. Unfortunately, many of these power lines cross over forestland ecosystems. When fires ignite in these vegetation types, the fires tend to be slower moving and burn at relatively high intensities. Additionally, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Most power line corridors have been cleared of vegetation both near the wires and from the ground below. Observations across the County of the primary transmission lines lead to the conclusion that many of the Okanogan Public Utilities District and Okanogan County Electric Co-op lines should be evaluated for potential widening of the corridor and further removal of brush and other vegetation from the ground below the wires.

At particular risk in Okanogan County is the PUD power line going over Loup Loup Pass. The Loup Loup Pass line is the sole power source for most residents in the Methow Valley. The loss of this line for an extended period of time would be disastrous for many Methow Valley residents as they would not be able to perform daily governmental functions, water could not be pumped into homes or through the irrigation system, and there would be no power source for cooking, refrigeration, or heat in homes and businesses. A similar situation would be experienced in the Tunk Valley area if the PUD power line crossing over Wauconda Summit was lost.

The Bonneville Power Administration (BPA) also maintains several high tension power lines in the County; however, these lines cross only rangeland, agricultural, or otherwise developed areas. Nearly all Okanogan County residents are dependent on this power grid for electricity. The use of these areas as "fuel breaks" should be evaluated further, especially in light of the

treatments enumerated in this plan (e.g., intensive livestock grazing, mechanical treatments, and herbicide treatments).

**Water Supply:** In many of Washington's communities, water is derived from surface flow that is treated and piped to homes and businesses. When wildfires burn a region, they threaten these watersheds by the removal of vegetation and creation of ash and sediment. As such, watersheds should be afforded the highest level of protection from catastrophic wildfire impacts. In Okanogan County, water is supplied to many homes by single home or multiple home wells or pumped from the major rivers.

**Table 5.3. Action Items for Infrastructure Enhancements.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.3.a: Post “Emergency Evacuation Route” signs</b> along the identified primary and secondary access routes.	<b>Protection of people and structures</b> by informing residents and visitors of significant infrastructure in the County that will be maintained in the case of an emergency.  Priority: High	<b>Lead:</b> County Emergency Manager <b>Support:</b> County Public Works, County Commissioner’s Office, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16.	Year 1 (2007): Purchase of signs.  Post roads and make information available to residents of the importance of Emergency Routes.
<b>5.3.b: Thin vegetation and widen PUD and Okanogan Electric Co-op transmission lines in high risk areas.</b>	<b>Protection of people and structures</b> by reducing the risk of an ignition along the line and decreasing the risk of losing these lines in the event of wildland fire in the vicinity.  Priority: High	<b>Lead:</b> Okanogan County Public Utilities District and Okanogan County Electric Co-op <b>Support:</b> adjacent landowners	Year 1 (2007): Conduct necessary landowner meetings, feasibility studies, and environmental surveys to determine viability of project and options.  Year 2 (2008): Develop forest plan for thinning and widening corridors and hire necessary contractors.  Year 3 – 6 (2009-12): Implement project plan.
<b>5.3.c: Create and maintain defensible space around critical infrastructure including, but not limited to communication sites, community shelters, government buildings (city, County, State, federal, and tribal), petroleum storage sites, hospitals, water storage sites, and PUD Service Stations.</b>	<b>Protect people, structures, and increase firefighter safety</b> by decreasing the risk of loss of critical communications infrastructure to wildland fire.  Priority: High	<b>Lead:</b> County Emergency Manager <b>Support:</b> County Commissioners, incorporated cities of Oroville, Tonasket, Riverside, Omak, Okanogan, Conconully, Nespelem, Elmer City, Coulee Dam, Brewster, Pateros, Twisp, and Winthrop, Okanogan County Public Utilities District, and various facility/utility owners.	Year 1 (2007): Meet with facility and utility owners operating communications infrastructure in Okanogan County and set up a criteria for maintaining a defensible space in these areas.  Year 2 (2008): Develop defensible space plans and begin implementing hazardous fuel reduction projects.
<b>5.3.d: Connect dead end roads, where feasible, in one-way in, one-way out drainages to provide an additional escape route (e.g. Lost River Road, Alta Lake Road, Limebelt Road, Squaw Creek Road, Black Canyon Creek Road, Pine Forest Road, Antoine Creek Road, and Chilliwist Road).</b>	<b>Protection of people and structures</b> by providing better and safer ingress and egress from isolated communities.  Priority: Medium	<b>Lead:</b> County Emergency Manager <b>Support:</b> County Public Works, County Planning Department, USFS, BLM, DNR, BIA, and private landowners.	Year 1 (2007): Conduct full assessment of roads accessing one-way in, one-way out residential areas and determine feasibility of constructing connection roads.  Year 2 (2008): Beginning planning and engineering of new roads or rehabilitated roads where determined appropriate.  Year 3 (2009): Begin construction or rehabilitation of new connection roads.

**Table 5.3. Action Items for Infrastructure Enhancements.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.3.e: Access improvements of bridges, cattle guards, culverts, and limiting road surfaces (e.g. Pontiac Ridge Road, Crawfish Lake Road, Newby Road, Swanson Mill Road, Wolf Creek Road, and Harmony Heights Road).</b>	<b>Protection of people, structures, infrastructure, and economy</b> by improving access for residents and firefighting personnel in the event of a wildfire. Reduce the risk of a road failure that leads to the isolation of people or the limitation of emergency vehicle and personnel access during an emergency. <p>Priority: High</p>	<b>Lead:</b> County Public Works <b>Support:</b> County Commissioners, State of Washington (Lands and Transportation), USFS, DNR, BIA, and private landowners.	<p>Year 1 (2007): Update existing assessment of travel surfaces, bridges, and cattle guards in Okanogan County as to location. Secure funding for implementation of this project (grants).</p> <p>Year 2 (2008): Conduct engineering assessment of limiting weight restrictions for all surfaces (e.g., bridge weight load maximums). Estimate cost of \$1,000,000 which might be shared between County, BLM, USFS, State, and private based on landownership associated with road locations.</p> <p>Year 2 (2008): Post weight restriction signs on all limiting crossings, copy information to rural fire districts and wildland fire protection agencies in affected areas. Estimate cost at roughly \$15-\$25,000 for signs and posting.</p> <p>Year 3 (2009): Identify limiting road surfaces in need of improvements to support wildland firefighting vehicles and other emergency equipment. Develop plan for improving limiting surfaces including budgets, timing, and resources to be protected for prioritization of projects (benefit/cost ratio analysis). Create budget based on full assessment.</p>
<b>5.3.f: Fuels mitigation of the primary and secondary access routes</b> in the County to insure these routes can be maintained in the case of an emergency.	<b>Protection of people and structures</b> by providing residents and visitors with ingress and egress that can be maintained during an emergency. <p>Priority: High</p>	<b>Lead:</b> County Public Works and Washington Department of Transportation <b>Support:</b> County Commissioner's Office, USFS, DNR, BIA, and private landowners.	<p>Year 1 (2007): Full assessment of road defensibility and ownership participation.</p> <p>Implementation of projects (linked to item 5.2.i and 5.2.j).</p>
<b>5.3.g: Conduct roadside fuels management where needed along State Route 20 Infrastructure WUI.</b>	<b>Protection of people, structures, infrastructure, and economy</b> by improving access for residents and firefighting personnel in the event of a wildfire. Allows for a road based defensible area that can be linked to terrain based defensible areas. <p>Priority: High</p>	<b>Lead:</b> County Emergency Manager <b>Support:</b> Washington State Department of Transportation, USFS, and private landowners.	<p>Year 1 (2007): Conduct assessment along highway corridor and begin development of a project action plan to reduce fuels and subsequently the potential fire hazard along this corridor. Target at least 200' from each side of the road for an estimated cost of approximately \$700 per acre treated.</p> <p>Year 2 (2008): Conduct necessary environmental analyses.</p> <p>Year 3 (2009): Secure funding and begin laying out specific project areas.</p> <p>Year 4 – 9 (2010-2015): Implement projects.</p>
<b>5.3.h: Install a municipal water system in the Town of Conconully.</b>	<b>Protection of people, structures, infrastructure, and economy</b> by providing a clean and reliable year-round water source. <p>Priority: Medium</p>	<b>Lead:</b> Town of Conconully <b>Support:</b> County Emergency Manager and County Commissioners	<p>Year 1 (2007): Conduct feasibility study and cost analysis. Hire an engineer to begin designing a suitable municipal water system for Conconully. Begin contacting residents about the proposed system.</p> <p>Year 2 (2008): Confirm water system designs and create an implementation plan and timeline.</p> <p>Year 3 -5 (2009-2011): Hire appropriate contractors and begin installation process.</p>

**Table 5.3. Action Items for Infrastructure Enhancements.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan	
5.3.i: Improve Brown's Pass Road and Crawfish Lake Road to provide additional access out of the upper Tunk Valley.	<p>Protection of people, structures, infrastructure, and economy by providing additional safe evacuation routes for Tunk Valley residents.</p> <div>Priority: Medium</div>	<p><b>Lead:</b> Bureau of Indian Affairs and Confederated Tribes of the Colville Reservation</p> <p><b>Support:</b> County Emergency Manager, Okanogan County Commissioners, and residents of Tunk Valley area.</p>	<p>Year 1 (2007): Conduct assessment of current road corridors and begin development of a project action plan to widen and repair running surface.</p> <p>Year 2 (2008): Secure funding and begin laying out specific project areas. Estimated cost is \$4,000 per mile for gravel surface.</p> <p>Year 3 – 8 (2009-2014): Implement projects.</p>	
5.3.j: Improve and maintain Forest Road 3525 to provide additional access for residents in the Mount Hull area.	<p>Protection of people, structures, infrastructure, and economy by providing an additional safe evacuation route for Mount Hull residents.</p> <div>Priority: Medium</div>	<p><b>Lead:</b> US Forest Service</p> <p><b>Support:</b> County Emergency Manager, Okanogan County Commissioners, and residents of the Mount Hull area.</p>	<p>Year 1 (2007): Conduct assessment of current road corridors and begin development of a project action plan to widen and repair running surface.</p> <p>Year 2 (2008): Secure funding and begin laying out specific project areas. Estimated cost is \$4,000 per mile for gravel surface.</p> <p>Year 3 – 8 (2009-2014): Implement projects.</p>	
5.3.k: Access improvements through road-side fuels management (e.g. State Route 155, Lost River Road, Goat Creek Road, Wolf Creek Road, Pine Forest road system, Edelweiss road system, Twisp River Road, Libby Creek Road, Gold Creek Road, McFarland Creek Road, Squaw Creek Road, Alta Road, French Creek Road, Sinlahekin Road, Salmon Creek North Fork Road, West Conconully Road, Aeneas Valley road system, Swanson Mill Road, Forest Road 3525Bonaparte Lake Road, Lost Lake Road, Pontiac Ridge Road, Toroda Creek Road, Lyman Lake-Moses Meadows Road, Chesaw Road, and Crawfish Lake Road).	<p>Protection of people, structures, infrastructure, and economy by improving access for residents and firefighting personnel in the event of a wildfire. Allows for a road based defensible area that can be linked to a terrain based defensible areas.</p> <div>Priority: High</div>	<p><b>Lead:</b> County Emergency Manager</p> <p><b>Support:</b> County Public Works, State of Washington (Lands and Transportation), USFS, DNR, BIA, and private landowners.</p>	<p>Year 1 (2007): Update existing assessment of roads in Okanogan County as to location. Secure funding for implementation of this project (grants).</p> <p>Year 2 (2008): Specifically address access issues to roads identified in assessment. Identify forestland and rangeland fuels difficult to control during wildfire that would also respond well to thinning, pruning, and brush cutting (hand pile and burn or chip), while increasing ingress and egress use in wildfire emergencies. Target 200' from each side of the road for estimated cost of \$15-\$23,000 per mile of road treated.</p> <p>Year 3 (2009): Secure funding and implement projects to treat road-side fuels.</p>	
5.3.m: Implement roadside fuels treatments in project areas.	Miles	Acres	Project Cost	Priority Ranking
Aeneas Valley Project Area	173	7,937	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$5,555,900 for this project area.	Medium
Black Canyon Project Area	3	133	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$93,100 for this project area.	Low
Bonaparte Lake Project Area	10	300	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$210,000 for this project area.	Medium

**Table 5.3. Action Items for Infrastructure Enhancements.**

Action Item	Goals and Objectives		Responsible Organization	Timeline and Implementation Plan	
	Miles	Acres	Project Cost		Priority Ranking
<b>5.3.m: Implement roadside fuels treatments in project areas.</b>					
Buzzard Lake Project Area	30	1,113	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$779,100 for this project area.		Medium
Cascade Highway Project Area	8	380	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$266,000 for this project area.		High
Chilliwist Project Area	25	1,052	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$736,400 for this project area.		Medium
Conconully Project Area	28	1,107	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$774,900 for this project area.		Medium
Gold Creek Project Area	11	505	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$353,500 for this project area.		Medium
Havillah Project Area	60	2,769	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,938,300 for this project area.		Medium
Hwy 20 Corridor Project Area	33	1,312	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$918,400 for this project area.		Medium
Limebelt Project Area	100	2,063	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,444,100 for this project area.		Medium
Loomis Project Area	12	502	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$351,400 for this project area.		Medium
Lost Lake Project Area	13	473	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$331,100 for this project area.		Medium
Mazama Project Area	55	1,969	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,378,300 for this project area.		Medium
McFarland Creek Project Area	4	193	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$135,100 for this project area.		Medium
Pine Forest Project Area	11	448	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$313,600 for this project area.		Medium
Pontiac Ridge Project Area	55	2,494	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,745,800 for this project area.		Medium
Squaw Creek Project Area	2	93	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$65,100 for this project area.		Medium
Toroda Creek Project Area	55	2,512	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,758,400 for this project area.		Medium
Twisp River Project Area	45	2,040	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$1,428,000 for this project area.		Medium
Wolf Creek Project Area	20	597	Commercial and precommercial thinning and pruning within 200 feet from each side of the roadway cost approximately \$700 per acre totaling \$417,900 for this project area.		Medium



## 5.7 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Okanogan County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies and are fully supported by the Community Wildfire Protection Plan committee.

Specific repeated themes of needed resources and capabilities include:

- Retention and recruitment of volunteers
- Update firefighting equipment countywide
- Improved road and house number signage
- Training and development of rural firefighters in structure and wildland fire

Although additional, and specific, needs were enumerated by the districts in Okanogan County, these items were identified by multiple districts and in the public meetings. The implementation of each issue will rely on either the isolated efforts of the rural fire districts or a concerted effort by the County to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve countywide equity. However, the County Emergency Management Department may be an organization uniquely suited to work with all of the districts in Okanogan County and adjacent counties to assist in the prioritization of needs across district and even county lines. Once prioritized, County Emergency Management is in a position to assist these districts with identifying, competing for, and obtaining grants and equipment to meet these needs.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

Action Item	Goals and Objectives	Responsible Organization	Timeline and Implementation Plan
<b>5.4.a: Enhance radio availability in each district, link in to existing dispatch, improve range within the region, and conversion to consistent standard of radio types.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, City of Okanogan Fire Department, USFS, DNR, BIA, and Okanogan County Commissioners.	Year 1 (2007): Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities.  Year 2 (2008): Acquire and install upgrades as needed.
<b>5.4.b: Retention of volunteer firefighters.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department  <b>Support:</b> Wildland fire agencies working with a broad base of County citizenry.	Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers.  Year 1 (2007): Develop incentives program and implement it.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.c: Establish and map onsite water sources such as hydrants or underground storage tanks and drafting or dipping sites.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> County Commissioner's Office, County GIS Department, USFS, DNR, BIA, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Identify populated areas lacking sufficient water supplies and develop project plans to develop a permanent water source or drafting/dipping sites.  Implement project plans and begin mapping (GPS) known water sources and drafting/dipping sites to be provided to fire response agencies and County offices.
<b>5.4.d: Increase training and capabilities of firefighters.</b>	<b>Protection of people and structures</b> by direct fire fighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, City of Okanogan Fire Department  <b>Support:</b> County Emergency Manager, DNR, BLM, BIA, and USFS for wildland training opportunities and with the State Fire Marshall's Office for structural firefighting training.	Year 1 (2007): Develop a multi-County training schedule that extends 2 or 3 years in advance (continuously).  Identify funding and resources needed to carry out training opportunities and sources of each to acquire.  Year 1 (2007): Begin implementing training opportunities for volunteers.
<b>5.4.e: Facility, land, and basic equipment for a joint City of Okanogan/Fire District #3 fire station.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> City of Okanogan Fire Department and Okanogan County Fire District #3.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.f: Centralized Okanogan County fire training center to include large, modern classroom and training burn tower for more advanced, hands on training in operations and tactics.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> County Commissioners; Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Prepare project and business plans and obtain funding.  Year 2 - 4 (2008-10): Locate and purchase site of new training facility and begin construction.  Year 5 (2010): Purchase needed equipment to operate the facility.
<b>5.4.g: Obtain a 100 foot ladder truck for City of Okanogan Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> City of Okanogan Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.h: Facility, land, and basic equipment for a larger Okanogan County Fire District #2 fire station.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #2.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.i: Facility, land, and basic equipment for a three small one-engine stations on outskirts of Okanogan County Fire District #3.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #3.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.j: Facility, land, and basic equipment for a new station in the Alta Lake area on Okanogan County Fire District #15.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #15.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.k: Obtain an urban interface apparatus for the Methow station, a rescue apparatus for the Pateros station, and update aging brush trucks on Okanogan County Fire District #15.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #15.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.l: Additional funding to provide paid daytime staff at primary stations in Okanogan County Fire District #3, #6, City of Okanogan Fire Department, and Town of Winthrop Volunteer Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #3, #6, City of Okanogan Fire Department, and Town of Winthrop Volunteer Fire Department.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.m: Facility, land, and basic equipment for a new Winthrop fire station in Okanogan County Fire District #6.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #6.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.n: Facility, land, and basic equipment for a satellite station near Crumbacher in Okanogan County Fire District #4.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #4.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.o: Obtain newer structural engine and thermal imager for Okanogan County Fire District #4.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #4.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.p: Obtain three Type 4 engines for Okanogan County Fire District #3.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #3.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.q: Facility, business plan, MOUs, and basic equipment for a new Okanogan County Fire District in Tunk Valley.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Emergency Manager and Tunk Valley residents.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.r: Increase station capacity to house equipment at all three Okanogan County Fire District #3 stations.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Okanogan County Fire District #3.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.s: Hire a County Fire Marshal.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> County Commissioners, Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Create budget and work plan for new County full time position.  Year 2 (2008): Advertise job opening and select best candidate.
<b>5.4.t: Improve safety equipment and personal protective equipment for all Fire Districts in Okanogan County.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> Okanogan County Fire Districts #1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #13, #14, #15, and #16, Conconully Fire Department, City of Omak Fire Department, and City of Okanogan Fire Department.	Year 1 (2007): Complete an inventory of all supplies held by the Fire Districts (boots, turnouts, Nomex, gloves, modern lighting, straps, and hardware), and complete a needs assessment matching expected replacement schedule.  Develop Countywide re-supply process for needed equipment.
<b>5.4.u: Facility, business plan, and basic equipment for a Okanogan County Fire District #11 satellite station in Havillah area.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #11.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.v: Obtain structural equipment, air packs, and necessary training for Okanogan County Fire District #11.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #11.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.w: Obtain a 4x4 brush truck and funding for repairs to existing equipment for the Town of Conconully Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Town of Conconully Fire Department.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials, funding, and equipment.
<b>5.4.x: Facility, land, and basic equipment for a fire station in Okanogan County Fire District #9.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #9.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.y: Obtain a 3,000 gallon water tender, two newer brush trucks, and an updated pumper truck for Okanogan County Fire District #9.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #9.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.z: Facility, land, and basic equipment for a new and larger fire hall for the Town of Conconully Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Town of Conconully Fire Department.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.aa: Obtain a newer pumper truck and extrication vehicle and equipment for the Town of Winthrop Volunteer Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Town of Winthrop Volunteer Fire Department.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ab: Begin locating sites for future development of at least three all weather water storage facilities in the Tunk Valley.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> Tunk Valley residents <b>Support:</b> Okanogan County Emergency Manager	Year 1 (2007): Identify areas for water storage facilities within the Tunk Valley that would offer a strategic firefighting advantage.  Year 1 or 2 (2007-08): Approach affected landowners and begin acquiring permission to install facilities.

**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.ac: Facility, land, and basic equipment for a new fire hall for the Town of Winthrop Volunteer Fire Department.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Town of Winthrop Volunteer Fire Department.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ad: Facility, land, and basic equipment for a new fire hall for Okanogan County Fire District #7.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #7.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ae: Obtain updated rolling stock (including a water tender), washer &amp; dryer, a hose washer &amp; dryer, and basic life support equipment for Okanogan County Fire District #7.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #7.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.af: Support the maintenance and/or enhancement of State and Federal firefighting programs and resources in Okanogan County.</b>	<b>Protection of people and structures</b> by direct wildland firefighting capability enhancements.  <div>Priority: High</div>	<b>Lead:</b> County Emergency Manager  <b>Support:</b> County Commissioners.	Ongoing: Provide community and County support for the State and Federal fire and firefighting programs within the County.  Assist State and Federal fire programs raise awareness of wildland fire issues in local communities.
<b>5.4.ag: Facility, land, and business plan (including recruitment and training program) for the new Okanogan County Fire District #16.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #16	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ah: Obtain updated rolling stock for Okanogan County Fire District #12.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #12.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ai: Obtain funding for land and a new station at a better location in Okanogan County Fire District #12.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #12.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.



**Table 5.4. Action Items for Firefighting Resource and Capability Enhancements.**

<b>Action Item</b>	<b>Goals and Objectives</b>	<b>Responsible Organization</b>	<b>Timeline and Implementation Plan</b>
<b>5.4.aj: Obtain two Type 6 4x4 wildland trucks, one Type 4 4x4 wildland truck, two 2,500+ gallon tenders, and one short wheel-base 4x4 structure truck for Okanogan County Fire District #16.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #16.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.ak: Obtain updated rolling stock equipped with both fire and rescue gear for Okanogan County Fire District #11.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #11.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.al: Expand storage and bay capacity of both the Molson and Chesaw Fire Stations in Okanogan County Fire District #11.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #11.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
<b>5.4.am: Updated turnouts and wildland firefighting personal gear for Okanogan County Fire District #11.</b>	<b>Protection of people and structures</b> by direct firefighting capability enhancements.  <div>Priority: Medium</div>	<b>Lead:</b> Okanogan County Fire District #11.	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources.  Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

## **5.8 Local Community Wildfire Protection Plan Mitigation Action Plans**

### **5.8.1 Methow Mitigation Action Plan**

There are six main categories of mitigation actions identified by members of the Coordinating Group. Categories include Planning, Fuels reduction, Education and Outreach, Rural Fire District capacity improvement, Biomass Utilization, and Smoke management.

#### **Planning Recommendations**

- Improve the capacity of the Methow Community Fire Plan Coordinating Group to continue serving as the focal point for collaborative forest and fuels management activities in the Methow Valley watershed. This group of stakeholders will be valuable for updating this CWPP, planning, prioritizing and monitoring forest management activities across ownerships, and identifying other collaborative opportunities. Funding for facilitation, organizational development and travel assistance for non-funded members will improve the ability of this entity to continue providing a valuable service to the community.
- Collaborate with Okanogan County Fire Plan Steering Committee and Okanogan County Natural Resource Planner to continue incorporating wildfire planning into the

County Comprehensive Plan Update process. Including fire prevention planning in this process could inform zoning and development ordinances before significant subdivision or population growth occurs in parts of the Plan area. Maintain and update the Fire Planning portion on a schedule that complements other Fire Plan updates.

### ***Fuels Reduction Recommendations***

- Implement “Firewise” recommendations within 200 feet of all private homes and essential infrastructure. Actions include the establishment of “defensible” space, adequate turn-around space for emergency equipment, and clear consistent address signage.
- Create shaded canopy fuel breaks in the planning area on strategically identified areas that will have the greatest benefit for the entire project area. The objective of the shaded fuel break strategy is to help reduce the potential of a wildfire moving from public to private lands and vice versa across the landscape. Particular attention will be paid to neighborhood and more densely populated areas adjacent to heavy fuels, and areas adjacent to critical community infrastructure such as the Loup Loup Transmission Line.
- Encourage the U.S. Forest Service to continue coordinating fuels reduction and forest health projects on lands adjacent to private ownership within the CWPP area as the risk assessment and prioritization process continues.
- Treat vegetation within 50 - 100 feet of roads and driveways. This can include shaded canopy defensible space on both sides of the road, road signs, and clearly marked evacuation routes.
- Encourage adjacent landowners and agencies to perform complementary treatments on their land by increasing involvement in the public planning process and inviting neighboring private landowners to participate in “Fire Wise” workshops and other educational opportunities.
- Improve funding opportunities to assist landowners in meeting their responsibilities for risk mitigation and forest stewardship by exploring cost-sharing agreements and partnerships.

### ***Prevention Education and Outreach Recommendations***

- Provide opportunities for “hands-on” stewardship and risk reduction training for homeowners and local contractors.
- Assist community members to access funding and resources needed to complete fuels reduction and defensible space creation on their properties.
- Continue conducting risk assessments of individual structures and essential infrastructure, ensuring data is used to implement identified recommendations, inform planning efforts and educate landowners.
- Obtain sufficient GPS equipment for use by DNR and their partners to ensure risk assessment data can be mapped accurately.
- Compile essential “Fire Wise” information and distribute to landowners in the CWPP planning area. Information presented should cover landowner responsibilities and individual preparedness.



- Assist DNR to improve landowner understanding, interest and compliance with NFPA299 on-site assessments.

### ***Fire Response Capacity Recommendations***

Fire District #6: Purchase two Type 4 interface engines and two type 6 4X4 engine. The wildland engines are the District's top priority.

- Complete Evacuation Plans for all at-risk sub-drainages with sufficient population density.
- Update physical addressing and acquire an integrated dispatch on-board or laptop computer with GPS mapping system for response efficiency
- Create a locator map of year round water supplies
- Work with landowners and County Planning to address access issues including road conditions for ingress and egress requirements, possible local fire zoning ordinances and/or variances with communities
- Fire District #6: Replace Winthrop Fire Station. The station is an 1940's building with additions in 1984 and 2005

### ***Bio-Mass Utilization Recommendations***

Currently the Okanogan Community Development Council (OCDC), a non-governmental organization in Twisp, works on market development and utilization opportunities for small diameter wood products in the region. As an active participant in the Coordinating Group, opportunities to coordinate fuels reduction work with biomass utilization efforts are envisioned through this plan. Small diameter wood products like furniture, fencing, structures and other products have been developed through OCDC. The organization has recently demonstrated a small diameter utilization sort yard where small scale processing and marketing of suppressed Douglas-fir flooring and ponderosa pine paneling is being piloted. Partnerships with OCDC for utilizing the traditionally non-merchantable byproducts of fuels reduction work should be part of any holistic implementation project.

The Okanogan Biomass Working Group, a collaborative of entities including OCDC, Okanogan Conservation District, Methow Valley Ranger District, Washington DNR, Bearfight Institute, Okanogan Rural Electric Association, Okanogan Public Utility District and Energy Northwest has secured funding to study the feasibility of an appropriately scaled biomass cogeneration facility that could benefit fuels reduction goals while providing an alternative source of locally-generated electricity. Bearfight Institute has also applied for funding to conduct research and demonstration on biofuels sourced from woody biomass.

Opportunities associated with the results of these studies should be incorporated into future planning and implementation efforts.

### ***Smoke Management Recommendations***

Air quality issues associated with smoke from summer wildfires and prescribed burns continue to be increasing public concerns. Reported symptoms from smoke generated by local fires include upper and lower respiratory ailments, eye irritation, sinus irritation, headaches and many other effects. Evidence shows the level of toxic inhalants released during cold burns/springtime burns are higher than during dry burns later in the season. Public tolerance for smoke resulting from prescribed controlled burning during spring may be lessening because of the compound effect of recurrent smoke associated with adjacent summer wildfires in the region.

In addition to health related impacts, smoke created from wildfire also directly affects the local economy in the Methow Valley, which is dependent on tourism for local jobs and revenue during summer months. Visual impairments from smoke have also been listed as concerns by local residents.

The health concerns, visual effects, and economic impacts associated with fuels mitigation projects should be acknowledged and could be addressed by future updates to this CWPP. Collaboration between state and County health agencies, Department of Ecology, the US Forest Service and the public to address outreach and education for prescribed burns that are proposed on Forest Service is underway.

Currently the US Forest Service, Department of Ecology, and DNR coordinate burn plans under guidelines set forth by the Smoke Management Plan (DNR, 1998). Any prescribed burns associated with the CWPP need to address smoke management at some level, and this planning group should cooperate with the Forest Service on how to address these concerns.

### **5.8.2 Havillah Mitigation and Action Plan Recommendations**

- A. Encourage and help local land owners to seek grants and financial assistance to help them manage fuel loadings and over stocked timber stands on their private timber lands. Area residents will work with the Forest Service and Washington State Department of Natural Resources to apply for grant funding.
- B. Encourage the US Forest Service and Washington State DNR to take action to reduce fuel loadings (and thus reduce the risk of wildfire) on their lands within 10 miles of the Havillah Community Wildfire Protection Plan area. This is especially important since there is a historical track record of large fires moving from public land to private land and burning up to 10 miles in a burn period. These agencies should focus on areas with known timber insect and disease problems which are causing huge fuel build ups. Commercial timber stand thinning, pre commercial thinning, pruning, and burning are necessary activities on these lands. Areas that have been identified as needing immediate treatment by the DNR include:

- a. Helleson Fuels Treatment in T28N, R 28E, S16
- b. Oberg Fuels Treatment in T28N, R28E, S36 and S12

Areas that have been identified as needing immediate treatment by the US Forest Service include:

- a. Mt. Hull Fuels Treatment area in T40N, R28E, S30, S31, S32, S33; T40N, R27E, S35, S36.
- b. Dry Gulch Fuels Treatment area in T39N, R28E, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11; T39N, R27E, S1 and S2.
- c. Wilcox Mt. Fuels Treatment in T39N, R28E, S13, S14, S15, S23 and S24. 11
- d. North Bonaparte Fuels Treatment in T38N, R29E, S35; T38N, R29E, S1, S2, S3, S8, S9, S10.
- e. Burge Mt. Fuels Treatment in T38N, R28E, S13, S14, S22, S23, S24 and S25; T28N, R29E, S18, S19, S29, and S30.

- C. Request the US Forest Service and/or Washington State DNR to provide silviculture prescriptions for private timber land owners who request them which will improve forest health and reduce the likelihood of crown fires on private lands.

- D. Encourage local land owners to create maps of ranch and logging roads on their own property which they can make available as needed to fire fighting resources as they respond to fires on their lands.
- E. Encourage the people in the plan area to adopt standards for safe access on roads for fire fighting equipment.
- F. Seek grant money from the Forest Service or DNR for fire fighting equipment, both hand tools and other equipment for local residents to use when responding to wild land fires.
- G. Seek grant money from the Forest Service or DNR for a commercial chipper to treat thinning slash to be shared within the plan area. Also secure equipment to remove the chips from the treated area.
- H. Contact State Representatives, Senators and elected officials in an effort to change state air quality standards to promote more slash burning on private and public lands to reduce fuel loadings.
- I. Help the Washington State DNR in its effort to notify the local public of the Local Community Fire Safety Training workshops conducted by the DNR. Perhaps host a workshop within the Havillah community area.
- J. Consider the establishment of a local Havillah Area Rural Fire District.
- K. Help local land owners seek grant money from the Forest Service or DNR for creating or improving “defensible space” around residences and/or take advantage of the services being offered the Highlands Fire Defense Team for defensible space.
- L. Work with a notify area environmental groups and advocacy organizations of the desire of the local residents to promote forest/timber stand health, the thinning of timber stands and treatment of fuels within 10 miles of the Havillah Community Fire Protection plan area. Request that these groups join in support of such action.
- M. Some local residents will provide input to the planning and analysis of projects for the US Forest Service. They would also participate in the forest plan update process. Forest Service projects should include thinning pruning, burning and other treatments to improve forest timber stand health and reduce fuel loadings and fire risks.
- N. Encourage the County Road Department, the US Forest Service and private landowners to treat and establish fuel breaks along their roads.
- O. Establish water storage in the plan area for fighting wildfire. Develop a map and list available water sources.
- P. Encourage grazing on private and public’s lands as a fuel reduction measure.
- Q. Create a map listing the location of all residences in the plan area.

### **5.8.3 Pine Forest Community Mitigation Action Plan**

The priority projects of the Pine Forest landowners are to continue the fuels treatment program by treating the remainder of the exterior shaded fuel break, the steep slopes and channels with heavy fuels loading, and the dense stands within the development. A second priority is the completion of fuel breaks along the interior roads and development of the emergency evacuation route up to Thompson Ridge road system. (see Project Map – page 19.) The objectives of these projects are to better provide a safe evacuation route and safe area if trapped and to reduce fire intensity within the community. Additional priorities are the continuing

education of the landowners, upgrading the water system to provide standard fire hydrants and to initiate the ongoing maintenance that will be required.

The Pine Forest Community Wildfire Protection Plan has five categories of mitigation actions: Roads - ingress/egress, Fuels Reduction, Public Education and Outreach, Suppression Capability, and Public Agency Coordination. Natural Vegetation/Habitat Restoration is incorporated into the Fuels Reduction projects. Recommendations by category are provided below.

The Pine Forest Steering Committee has prioritized the recommendations (**delineated as PnFr High, Medium or Low**). The (**PnFr High**) items will be emphasized for their accomplishment. They will be put into an action plan and funding will be sought to implement these projects. Additionally these priority items will be recognized as the highest priority projects for implementation by the Pine Forest area landowners.

1. Issue – Roads ingress/egress

a. Fuels reduction along roads. (**PnFr High**)

- i. Mitigation goal – develop shaded fuel break along the main loop roads.
- ii. Mitigation Goal – Extend the fuels breaks to the remaining spur and dead-end roads.

b. Roads unsafe for firefighting personnel to access. (**PnFr Medium**)

- i. Mitigation Goal – Map roads accessible by fire vehicles. Sign those that are dead end or are inaccessible.

c. Need improved secondary access in case of fire emergency. (**PnFr High**)

- i. Work with Forest Service to develop an emergency escape route from Nighthawk Ridge and the cattle guard at Four Corners westerly up to the Thompson Ridge road system.
- ii. Implement the improvement work.

d. Develop uniformity of road and address signs and install signs at strategic locations. (**PnFr Medium**)

- i. Mitigation Goal – Develop a road and address sign plan for the Pine Forest community.
- ii. Mitigation Goal – Provide means for acquiring standard signs and directions on installation.
- iii. Mitigation Goal – Install “dead end road” signs and warning signs on roads unsuitable for fire emergency vehicles.

2. Issue - Fuels Reduction for Pine Forest (a portion of the Twisp-Winthrop WUI, a community at risk)

a. Natural Resources Protection (**PnFr High**)

- i. Mitigation Goal – Treat fuels in areas to protect communities and infrastructure at risk.
  1. Work with the Forest Service to complete shaded fuel break along northerly boundary of the development
  2. Treat remainder of dense stands in the interior of the community

- ii. Mitigation Goal – Maintain existing and future fuels reduction projects.
  - 1. Trim or mow sprouting vegetation along the roadsides to sustain effective shaded fuel breaks.
  - 2. Continue maintenance of fuels within the defensible spaces around structures.
  - 3. In coordination with the landowners, Fire District, Forest Service, and Department of Natural Resources, develop and implement demonstration projects, including the use of prescribed fire, to maintain desired fuels levels.
- iii. Mitigation Goal – Develop a team to locate and prioritize landscape scale fuels projects.

b. Homesites (**PnFr High**)

- i. Mitigation Goal – Implement defensible space guidelines and create defensible space around homes.
- ii. Mitigation Goal – Provide information for homeowners for measures they can take to reduce ignitability of structures.
  - 1. With brochures, association meetings, newspapers, etc.
  - 2. During building permit review and approval process.

c. Disposing of Excess Fuels (**PnFr Medium**)

- i. Mitigation Goal – Develop and implement plan to dispose of excess fuels generated during fuels treatment projects.
- ii. Mitigation Goal – Explore opportunities for utilization of material generated during fuels treatment projects.

d. Monitor Effectiveness and Validate Work (**PnFr High**)

- i. Mitigation Goal – Review projects to see that work is what was intended, to see if it was effective and to learn how to adapt and improve.

3. Issue – Public Education and Outreach

a. Community Preparedness (**PnFr High**)

- i. Mitigation Goal – Implement risk assessment recommendations of individual properties with prescriptions as identified in the assessments.
- ii. Mitigation Goal – Develop and implement community fire emergency and evacuation plan, including how to contact and notify landowners (phone trees, sirens, radio stations, etc.) and interaction with firefighting officials.
- iii. Mitigation Goal – Encourage individuals to develop personal emergency action plans, to include:
  - a. Individual responsibilities and residential and personal security, i.e., creating defensible spaces, landscaping in fire country, creating fire breaks, Fire Wise construction materials, visible house numbers, etc.

- b. Individual preparedness: How to create a Personal Emergency Action Plan (personal escape routes, disaster supply list, personal communication plan),
    - c. What to do and what NOT to do in case of wildfire.
    - d. Interacting with local firefighting and law enforcement officials.
  - iv. Mitigation Goal – Provide uniform signage for roads and addresses.
- b. Prevention (**PnFr High**)
  - i. Mitigation Goal – Residents aware of risks and responsibilities of living within Wildland Urban Interface
    - 1. Conduct Fire Wise Workshops.
    - 2. Provide information packets to all present and new landowners.
  - ii. Mitigation Goal – Include Fire Wise considerations in review process for building.
    - 1. Expand review criteria to include restrictions and/or recommendations regarding construction materials, landscaping materials, and road design.
    - 2. Provide information packets to those considering building or remodeling.
  - iii. Mitigation Goal – Initiate fire restrictions and provide notifications to landowners
    - 1. Develop and maintain fire message bulletin board at junction of Blackjack Road, to include:
      - a. Fire Danger Levels
      - b. Burn bans and other restrictions
      - c. Emergency call number – Dial 911
    - 2. Winthrop and Twisp Fire Districts initiate burn bans and other fire restrictions.
    - 3. Provide fire prevention messages and notifications on bulletin boards, signs and other media.
    - 4. Prosecute violators.
  - iv. Mitigation Goal – Explore possibilities to receive incentives for construction with fire resistant materials.
- c. Emergency Services (**PnFr High**)
  - i. Mitigation Goal – Provide current road and address maps to all fire, law enforcement, and emergency medical entities. (see Pine Forest Emergency Services Map – page 25)
- d. Outreach (**PnFr Medium**)
  - i. Mitigation Goal – Compile and make available to general public fire risk information and actions being initiated to reduce these risks.

1. Distribute information about Pine Forest's initiatives to media and surrounding communities.
    2. Emphasize how groups work collectively together.
  - ii. Mitigation Goal – Encourage Pine Forest and neighboring residents to come together to promote community safety.
4. Issue – Suppression Capability
- a. Fire District Staffing (**PnFr Low**)
    - i. Mitigation Goal – Current staffing is inadequate to assure adequate protection, training and coordination.
      1. Provide two additional paid employees for District #6.
  - b. Available Resources (**PnFr Low**)
    - i. Mitigation Goal – Continued development within the WUI requires increased suppression capabilities.
      1. Provide additional two Type 4 engines for WUI protection.
  - c. Water Availability (**PnFr High**)
    - i. Mitigation Goal – The community water system is inadequate for standard fire hydrants for structural protection.
      1. Develop a strategic plan to upgrade the community water system to accommodate standard fire hydrants.
      2. Secure funding and implement the upgrading program.
    - ii. Mitigation Goal – Provide additional safeguards at “safe area” at end of Nighthawk Road
      1. Develop storage tank for gravity water at this area.
5. Issue – Public Agency Coordination
- a. Agency and Group Collaboration (**PnFr Medium**)
    - i. Mitigation Goal – Participating agencies and Pine Forest continue to work together to monitor, improve, and adapt program.
      1. Work with the Methow Valley, Okanogan County and participating agencies and landowners to implement a County-wide CWPP.
  - b. Project Coordination (**PnFr High**)
    - i. Mitigation Goal – Pine Forest and Forest Service coordinate treatment of the National Forest areas that are a threat to the community.
  - c. Process of Fire Response (**PnFr Medium**)
    - i. Mitigation Goal – Describe fire response procedures and conditions:
      1. Within the Pine Forest community
      2. In surrounding forested areas
      3. Identify and distribute evacuation conditions and procedures
  - d. Website Resources (**PnFr Medium**)

- i. Mitigation Goal – Identify and include in information packets information sources for Fire Wise development, emergency measures, current conditions, contacts, etc.

#### 5.8.4 Edelweiss Development Mitigation Action Plan

The priority projects of the Edelweiss landowners are to continue the fuels treatment program by treating the high-risk areas of the ephemeral draws, the remainder of the exterior shaded fuel break, and the dense stands within the development. A second priority is the completion of fuel breaks along the interior roads and development of the East Fawn Road into a satisfactory evacuation route. (see CWPP Project Map – page 17.) The objectives of these projects are to better provide a safe evacuation route and safe area if trapped and to reduce fire intensity within the community. Additional priorities are the continuing education of the landowners, upgrading the water system to provide standard fire hydrants and the ongoing maintenance that will be required.

The Edelweiss Community Wildfire Protection Plan has five categories of mitigation actions: Roads - ingress/egress, Fuels Reduction, Public Education and Outreach, Suppression Capability, and Public Agency Coordination. Natural Vegetation/Habitat Restoration is incorporated into the Fuels Reduction projects. Recommendations by category are provided below.

The Edelweiss Steering Committee has prioritized the recommendations (**delineated as EMC High, Medium or Low**). The (**EMC High**) items will be emphasized for accomplishment. They will be put into an action plan and funding will be sought to implement these projects. Additionally these priority items will be recognized as the highest priority projects for implementation by the Edelweiss area landowners.

##### 6. Issue – Roads ingress/egress

##### a. Fuels reduction along roads. (**EMC High**)

- i. Mitigation goal – develop shaded fuel break along the main loop roads.
- ii. Mitigation Goal – Extend the fuels breaks to the remaining spur and dead-end roads.

##### b. Dead end roads unsafe for firefighting personnel to access. (**EMC Medium**)

- i. Mitigation Goal – Map roads accessible by fire vehicles. Sign those that are dead end or are inaccessible.

##### c. Need improved secondary access in case of fire emergency. (**EMC High**)

- i. Develop cooperative approach with the Forest Service to improve East Fawn Road into a safe ingress/egress access route.
- ii. Implement the improvement work.

##### d. Develop uniformity of road and address signs and install signs at strategic locations. (**EMC High**)

- i. Mitigation Goal – Develop a road and address sign plan for the Edelweiss community.
- ii. Mitigation Goal – Provide means for acquiring standard signs and directions on installation.



- iii. Mitigation Goal – Install “dead end road” signs and warning signs on roads unsuitable for fire emergency vehicles.
- 7. Issue - Fuels Reduction for Edelweiss (a portion of the Twisp-Winthrop WUI, a community at risk (EMC High))
  - a. Natural Resources Protection
    - i. Mitigation Goal – Treat fuels in areas to protect communities and infrastructure at risk.
      - 1. Treat the ephemeral draw between pump house and Highland Meadows.
        - a. Reach agreement with adjacent landowner to conduct fuels reduction.
        - b. Treat the fuels.
      - 2. Complete shaded fuel break along top and east corner of the development
      - 3. Provide additional treatment on the steep slope and ephemeral draw from the Goat Creek Road to the Homestead Road.
      - 4. Treat remainder of dense stands in the interior of the community
    - ii. Mitigation Goal – Maintain existing and future fuels reduction projects.
    - iii. Mitigation Goal – Develop a team to locate and prioritize landscape scale fuels projects.
  - b. Homesites
    - i. Mitigation Goal – Implement defensible space guidelines and create defensible space around homes.
    - ii. Mitigation Goal – Provide information for homeowners for measures they can take to reduce ignitability of structures.
      - 1. With brochures, association meetings, newspapers, etc.
      - 2. During building permit review and approval process.
  - c. Utility Corridors
    - i. Mitigation Goal – Proactively trim growth and remove hazard trees along the power line to the pump house annually to prevent outages and fires.
  - d. Disposing of Excess Fuels
    - i. Mitigation Goal – Develop and implement plan to dispose of excess fuels generated during fuels treatment projects.
    - ii. Mitigation Goal – Explore opportunities for utilization of material generated during fuels treatment projects.
  - e. Monitor Effectiveness and Validate Work
    - i. Mitigation Goal – EMC Board in conjunction with the Fire District, Forest Service, and Department of Natural Resources review the projects to see that work accomplished is what was intended, to see if it was effective and to learn how to adapt and improve.

8. Issue – Public Education and Outreach (EMC Medium)

a. Community Preparedness

- i. Mitigation Goal – Implement risk assessment recommendations of individual properties with prescriptions as identified in the assessments.
- ii. Mitigation Goal – Develop and implement community fire emergency and evacuation plan, including how to contact and notify landowners (phone trees, sirens, radio stations, etc.) and interaction with firefighting officials. (See Appendix \_\_\_\_)
- iii. Mitigation Goal – Encourage individuals to develop personal emergency action plans, to include:
  - a. Individual responsibilities and residential and personal security, i.e., creating defensible spaces, landscaping in fire country, creating fire breaks, Fire Wise construction materials, visible house numbers, etc.
  - b. Individual preparedness: How to create a Personal Emergency Action Plan (personal escape routes, disaster supply list, personal communication plan),
  - c. What to do and what NOT to do in case of wildfire.
  - d. Interacting with local firefighting and law enforcement officials.
- iv. Mitigation Goal – Provide uniform signage for roads and addresses.

b. Prevention

- i. Mitigation Goal – Residents aware of risks and responsibilities of living within Wildland Urban Interface
  1. Conduct Fire Wise Workshops.
  2. Provide information packets to all present and new landowners.
- ii. Mitigation Goal – Include Fire Wise considerations in review process for building.
  1. Expand review criteria to include restrictions and/or recommendations regarding construction materials, landscaping materials, and road design.
  2. Provide information packets to those considering building or remodeling.
- iii. Mitigation Goal – Initiate fire restrictions and provide notifications to landowners
  1. Develop and maintain fire message bulletin board at entrance of Homestead Road, to include:
    - a. Fire Danger Levels
    - b. Burn bans and other restrictions
    - c. Emergency call number – Dial 911

2. Winthrop and Mazama Fire Districts initiate burn bans and other fire restrictions.
    3. Provide fire prevention messages and notifications on bulletin boards, signs and other media.
    4. Prosecute violators.
  - iv. Mitigation Goal – Explore possibilities to receive incentives for construction with fire resistant materials.
  - c. Emergency Services
    - i. Mitigation Goal – Provide current road and address maps to all fire, law enforcement, and emergency medical entities.
  - d. Outreach
    - i. Mitigation goal – Compile and make available to general public fire risk information and actions being initiated to reduce these risks.
      1. Distribute information about Edelweiss’ initiatives to media and surrounding communities.
      2. Emphasize how groups work collectively together.
    - ii. Mitigation Goal – Encourage Edelweiss and neighboring residents to come together to promote community safety.
9. Issue – Suppression Capability
- a. Fire District Staffing (**EMC Low**)
    - i. Mitigation Goal – Current staffing is inadequate to assure adequate protection, training and coordination.
      1. Provide 2 additional paid employees for District #6
  - b. Available Resources (**EMC Low**)
    - i. Mitigation Goal – Continued development within the WUI requires increased suppression capabilities.
      1. Provide additional 2 Type 4 Engines for WUI protection
  - c. Water Availability (**EMC High**)
    - i. Mitigation Goal – The community water system is inadequate for standard fire hydrants for structural suppression..
      1. Develop a strategic plan to upgrade the community water system to accommodate standard fire hydrants.
      2. Secure funding and implement the upgrading program.
10. Issue – Public Agency Coordination
- a. Agency and Group Collaboration (**EMC Medium**)
    - i. Mitigation Goal – Participating agencies and Edelweiss continue to work together to monitor, improve, and adapt program.
      1. Work with the Methow Valley, Okanogan County and participating agencies and landowners to implement a County-wide CWPP.

- b. Project Coordination **(EMC High)**
  - i. Mitigation Goal – Edelweiss and Forest Service coordinate treatment of the National Forest areas that are a threat to the community.
- c. Process of Fire Response **(EMC Low)**
  - i. Mitigation Goal – Describe fire response procedures and conditions:
    1. Within the Edelweiss community
    2. In surrounding forested areas
    3. Identify and distribute evacuation conditions and procedures
- d. Website Resources **(EMC Low)**
  - i. Mitigation Goal – Identify and include in information packets information sources for Fire Wise development, emergency measures, current conditions, contacts, etc.

## **5.9 Regional Land Management Recommendations**

Reference has been given to the role that forestry, grazing and agriculture have in promoting wildfire mitigation services through active management. Okanogan County is a rural County by any measure. It is dominated by wide expanses of forest and rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the US Forest Service, the Bureau of Land Management, the Washington Department of Natural Resources, the Colville Reservation, industrial forestland owners, private forestland owners, and all agricultural landowners in the region to actively manage their wildland-urban interface lands in a manner consistent with reducing fuels and risks in this zone.

The following sections (section 5.9.1 and 5.9.2) describe two amongst many potential fuels reduction methods available to land owners and managers. Although it is up to landowners or managers to choose the most environmentally safe, effective, and cost efficient method on a case by case basis, in general, salvage logging and prescribed burning, if done safely and correctly, are supported by this Community Wildfire Protection Plan committee in appropriate areas within the Wildland Urban Interface. This in no way suggests that salvage logging or prescribed burning are the only fuels reduction or forest management practices supported by this committee, but it does offer support for those land owners/managers or agencies who may wish to consider these methods. These statements do not alter, diminish, or expand the existing jurisdictions statutory and regulatory responsibilities and authorities or budget processes.

### **5.9.1 Salvage Logging on Recently Burned Areas in the Wildland Urban Interface**

Recent wildland fires in Okanogan County have left behind thousands of acres of severely burned timber. The Forest Service, the State, and numerous private landowners have begun the monumental task of identifying areas that can be effectively and efficiently salvage logged without initiating environmental damage on already susceptible ecosystems. Land management agencies and individuals commonly face many challenges that tend to delay salvage

operations. As a general statement, this planning team supports salvage logging in high priority areas of the Wildland Urban Interface (as defined in section 4.5 and the map in Appendix I) as long as the salvage would be effective in accomplishing both the economic recovery goals of the salvage as well as the fuels mitigation goals. Because salvage operations by nature require immediate attention, it is recommended that projects in previously identified project areas or high risk areas be given the highest priority.

## 5.9.2 Prescribed Fire Use in the Wildland Urban Interface

Prescribed fire can be incorporated into land use activities to help reduce wildland fire risk in the wildland urban interface. The extreme fire risk situation that exists in Okanogan County today will only be changed through a coordinated effort. Active forest management coupled with prescribed burning can significantly improve forest health while reducing fuel loads. Periodic prescribed burning incorporated with managed grazing can retain a higher degree of fine fuels. The Okanogan County Community Wildfire Protection Plan committee supports prescribed fire use, where appropriate, on forests and rangelands in Okanogan County in conjunction with fuels management and other land use practices.

## 5.10 Agency Projects: Current, Planned, Proposed, or On-going

The following sections help identify were some of the land management agencies in Okanogan County have planned, current, or proposed fuel reduction projects. Where possible, these projects have also been mapped and are presented in Appendix I. Knowing where agency projects are located can help this committee as well as other agencies prioritize their own fuels reduction projects. Simultaneous fuels reduction projects occurring on adjacent properties is not only encouraged, but this can also help cut down on costs.

### 5.10.1 Washington Department of Natural Resources

Table 5.5. is a list of ongoing and planned fuels reduction projects occurring on Washington Department of Natural Resources lands in Okanogan County.

Table 5.5. Department of Natural Resources Recent and Planned Fuels Reduction Project in South Okanogan District.				
Treatment Area	Anticipated Project	Project Type	Approximate Acres	Estimated Date
Adjacent to SR 20 and Loup Loup Power Line	Buck Mountain West	Pre-commercial thinning	603	2001
	Buck Mountain East	Pre-commercial thinning	351	2001
	Whiskey Dog	Lineskid Timber Sale	550	2003
	No Sweat	Tractor Timber Sale	187	2006
	Loup Summitt	Timber Sale	242	Ongoing
	Fire Crew	Thinning/Pruning	19	Ongoing
	Outyear (to be named later)	Timber Sale	334	2008-09 or beyond
Chilliwist Area	Poverty	Timber Sale	423	Ongoing/2007

The following is a list of areas identified by the Washington Department of Natural Resources as being in need of fuels reduction work to reduce the wildfire risk.

#### **5.10.1.1 Palmer View T.S. Area**

Location: N1/2 Section 10 and Section 3; T38N; R25E

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units.

Possible Techniques: harvest, thinning, piling, and burning.

#### **5.10.1.2 Bonaparte Lake Resort and Campground**

Location: Section 16; T38N; R30E

Objective: Create fuels break along mainline USFS 32 road by reducing fuels loading and ladder fuels. Provide for protection of the power line infra-structure.

Possible Techniques: thinning, piling, and burning.

#### **5.10.1.3 North Bonaparte T.S. Area**

Location: DNR managed lands in Section 24, 35 and 36; T39N; R29E and Section 19; T39N; R30E.

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units. In addition, reduce ladder fuels in the leave areas between units but in strategic areas.

Possible Techniques: harvest, thinning, piling, and burning.

#### **5.10.1.4 Pontiac Trap T.S. Area**

Location: Section 36; T40N; R30E.

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units. In addition, reduce ladder fuels in the leave areas between units but in strategic areas.

Possible Techniques: harvest, thinning, piling, and burning.

#### **5.10.1.5 Bannon T.S. Area**

Location: DNR managed lands in Section 12, 13, and 24; T36N; R28E.

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units.

Possible Techniques: harvest, thinning, piling, and burning.

#### **5.10.1.6 Turner Creek T.S. Area**

Location: DNR managed lands in Sections 13, 14, 22, 23 and 24; T38N; R31E.

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units. In addition, reduce ladder fuels in the leave areas between units but in strategic areas.

Possible Techniques: harvest, thinning, piling, and burning.

### 5.10.1.7 Bonaparte Meadows T.S. Area

Location: DNR managed lands in Section 20 and 21; T38N; R30E.

Objective: Break up fuels continuity with commercial timber harvest. Create fuels breaks along roads and property lines by treating created slash within harvest units. In addition, reduce ladder fuels in the leave areas between units but in strategic areas.

### 5.10.2 USDA Forest Service Projects

Federal laws require the US Forest Service to conduct environmental reviews when undertaking any action on federal land. The National Environmental Policy Act (NEPA) of 1969 is the basic law which mandates the government to conduct an analysis. The level of analysis required is dependent on the action being proposed and what potential effects to the environment may be brought forth by the action.

NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. As part of the Healthy Forests Initiative (HFI), the Forest Service has been granted authority to conduct streamlined analysis if proposed actions fall under certain categories and it has been demonstrated that further analysis is not needed. How the public is involved in the decision making is also different under HFI projects. One of the public involvement strategies includes using a collaborative approach to decision making such as working with County mitigation groups to help define project needs and priorities. It is the intent of the Forest Service to meet with the Okanogan County CWPP planning committee to seek input on prioritizing Forest Service Projects. The Forest Service feels it is important to keep this group active to help coordinate local state and federal fuels projects.

Table 5.6 and 5.7 show tentative lists of projects from the Tonasket Ranger District and the Methow Valley Ranger District, Okanogan and Wenatchee National Forest 5 – Year Action Plans and contains a mix of fuels reduction projects, burns, and/or timber sales. The type of contracting method will depend on the kind of work that is planned. This list of projects and estimated dates may vary according to recommendations from the Okanogan County Community Wildfire Protection Plan, available funding for agency personnel, and changing priorities. Each project is likely to involve a mix of treatment options ranging from commercial timber harvest to precommercial thinning, ladder fuel reduction, fuel breaks, mechanical piling, hand piling, and prescribed fire. Treatment options will be chosen based upon the inputs of a team of interdisciplinary specialists and public participants.

**Table 5.6. Tonasket Ranger District List of Proposed Projects in Okanogan County as of August 2006.**

<b>Anticipated Project</b>	<b>Planning Stage</b>	<b>Estimated Date</b>	<b>Potential Treatment Acres</b>
Sneed TS (1999) associated underburn	DN - 1999	Ongoing	2,693
Sneed IRP Underburning	DN - 1996	Ongoing	612
Bailout IRP Underburning	DN - 1998	2008	3,851
Redmill TS associated underburning	DN - 1998	2007	197
Coco IRP Underburning	DN - 2000	2007	2,765
Conger IRP Underburning	DN - 2003	2008	1,936
Conger TS Handpile and burning	DN - 2003	2007	905

**Table 5.6. Tonasket Ranger District List of Proposed Projects in Okanogan County as of August 2006.**

Anticipated Project	Planning Stage	Estimated Date	Potential Treatment Acres
Conger II TS associated underburning	DN - 2003	2007	1,719
Upper Aeneas IRP Burn	DN - 2004	2009	5,922
Upper Aeneas TS Harvest	DN - 2004	2006	2,286
Summit IRP Underburning	DN - 2005	2008	651
Summit TS Harvest	DN - 2005	2006	1,098
Josephine Fuels Analysis- Handpile and burn	DM - 2003	2005	804
2 Lakes Harvest	DN - 2005	2006	1,870
2 Lakes HFRA Fuel Treatment	DN - 2005	2006	1,697
Mutton TS Harvest	DN - 2006	2007	585
Mutton IRP Underburning	DN - 2006	2009	9,321
Siwash Thin Stewardship	DM - 2004	2006-2007	162
Frosty HFRA – Early Stage Planning	Early	2007	17,867 gross acres
Spatch HFRA	Early	2008	19,924 gross acres
Hominy IRP	Outyear	2008	12,800 gross acres
<b>Outyear projects</b>			
Big Mac	Outyear		
Black Diamond	Outyear		
Meadowlark	Outyear		
Cache	Outyear		
Flank	Outyear		

As noted above Table 5.7 lists proposed projects in the Methow Valley Ranger District's 5-Year Action Plan as of October of 2006.

**Table 5.7. Methow Valley Ranger District List of Proposed Projects in Okanogan County as of October 2006.**

Projected Year	Anticipated Project	Project Type	Approximate Acres
Ongoing	HH	Pre-Commercial & Commercial Thin (IRC)	2,450
	TF	Commercial Thin (TS)	400
2007	HH2	Pre-Commercial & Commercial Thin (IRC)	800
	Flatmoon	Commercial Thin (TS)	800
	Finley	Commercial Thin (TS)	250
	Lucky	Commercial Thin (TS) & Prescribed Fire	250
	South Fork Benson Creek	Prescribed Fire	717
	Coal	Prescribed Fire	1,344
	Deer Creek	Prescribed Fire	742



**Table 5.7. Methow Valley Ranger District List of Proposed Projects in Okanogan County as of October 2006.**

<b>Projected Year</b>	<b>Anticipated Project</b>	<b>Project Type</b>	<b>Approximate Acres</b>
	Yockey Creek	Prescribed Fire	2,110
	Ramsey Peak	Prescribed Fire	2,752
	Woody Creek	Prescribed Fire	500
	Jay Ridge	Prescribed Fire	1,450
	Finley Bottom	Prescribed Fire	212
	Vinegar Gulch	Prescribed Fire	308
	Hooker IIB	Prescribed Fire	
	Dry Cow Ridge	Prescribed Fire	
	Mt. Leecher	Prescribed Fire	
2008	Buck	Pre-Commercial & Commercial Thin	3,200
	Freestone	Commercial Thin (TS) & Prescribed Fire	250
	Smith/Elderberry	Commercial Thin (TS)	300
	Cougar Lake	Prescribed Fire	400
	Goat Creek	Prescribed Fire	800
	Russian Spring/French	Prescribed Fire	1,223
	Gulch Ranch	Prescribed Fire	1,034
	Mulhollan	Prescribed Fire	380
	Lower Yockey	Prescribed Fire	1,152
	Fawn Red Slash	Mechanical Handpiling	
	TPR Red Slash	Mechanical Handpiling	
2009	Lower Met.	Pre-Commercial & Commercial Thin (IRC)	3,200
	Middle Gold	Commercial Thin (TS)	50
	S. Gold	Commercial Thin (TS)	50
	Oxide	Commercial Thin (TS)	30
	Bug Burgett	Prescribed Fire	578
	Eightmile Bottom	Prescribed Fire	1,600
	Upper Rendezvous	Prescribed Fire	3,000
	Hungry Hunter Projects	Prescribed Fire	2,450
	Weeman Bridge	Prescribed Fire	640
	S. Twentymile	Prescribed Fire	3,000
2010	Middle Met.	Pre-Commercial & Commercial Thin (TS)	3,700
	Yockey	Commercial Thin (TS)	200
	Buck Lake	Prescribed Fire	1,203
	Falls Creek	Prescribed Fire	2,500
	Beaver Creek	Prescribed Fire	2,500
	Leroy/Bromas Creek	Prescribed Fire	1,000
	Libby Creek	Prescribed Fire	2,500

## Chapter 6: Supporting Information

### 6

#### 6.1 List of Tables

Table 2.1. Community Response to Public Mail Survey. ....	31
Table 2.2. Emergency Services Training received by household. ....	32
Table 2.3. Disasters affecting homes in Okanogan County. ....	32
Table 2.4. Fuel Hazard Rating Worksheet. ....	33
Table 2.5. Percent of respondents in each risk category as determined by the survey respondents. ....	33
Table 2.6. Public Opinion of Hazard Mitigation Funding Preferences. ....	34
Table 2.7. Public meeting slide show. ....	35
Table 3.1. Selected demographic statistics for Okanogan County, Washington, from Census 2000. ....	40
Table 3.2. Income in 1999. ....	42
Table 3.3. Poverty Status in 1999 (below poverty level). ....	42
Table 3.4. Employment and Industry. ....	43
Table 3.5. Class of Worker. ....	44
Table 3.6. Ownership Categories in Okanogan County. ....	45
Table 3.7. National Register of Historic Places in Okanogan County, Washington. ....	51
Table 3.8. Roads within the County by Ownership. ....	52
Table 3.9. Lookouts, Repeater Towers, and Communication Site Locations. ....	53
Table 3.10. Vegetative Cover Types in Okanogan County. ....	55
Table 3.11. Monthly climate records for Coulee Dam, Okanogan County, Washington. ....	56
Table 3.12. Monthly climate records for Methow, Okanogan County, Washington. ....	56
Table 3.13. Monthly climate records for Omak, Okanogan County, Washington. ....	57
Table 3.14. Monthly climate records for Tonasket, Okanogan County, Washington. ....	57
Table 3.15. Monthly climate records for Mazama, Okanogan County, Washington. ....	57
Table 3.16. Municipal Water Sources in Okanogan County. ....	60
Table 4.1. Summary of wildfire ignitions in Okanogan County from the Washington Department of Natural Resources database. ....	76
Table 4.2. Wildfire Ignition and Extent Summary by Year within the DNR Protection Area. ....	77
Table 4.3. Summary of wildfire ignitions in Okanogan County from the Confederated Tribes of the Colville Reservation database. ....	78
Table 4.4. Description of Fire Size Classes. ....	79

Table 4.5. Wildfire Ignition Summary by Year within the Colville Reservation.....	79
Table 4.6. Summary of wildfire ignitions in Okanogan County from the U.S. Forest Service database.....	80
Table 4.7. Description of Fire Size Classes.....	81
Table 4.8. Wildfire Ignition Summary by Year within the Colville Reservation.....	82
Table 4.9. National Fire Season Summaries.....	82
Table 4.10. Total Fires and Acres 1960 - 2004 Nationally.....	83
Table 4.11. Suppression Costs for Federal Agencies Nationally.....	83
Table 4.12. Selected Recent Fires in Okanogan County.....	86
Table 4.13. Fire Prone Landscape rankings and associated acres in each category for Okanogan County.....	89
Table 4.14. Neighborhood Ranking based on Fire Prone Landscapes.....	90
Table 4.15. Assessment of Historic Fire Regimes in Okanogan County.....	92
Table 4.16. Assessment of Historic Fire Regimes on U.S. Forest Service land in Okanogan County.....	92
Table 4.17. Fire Regime Condition Class Definitions.....	93
Table 4.18. Assessment of Current Condition Class in Okanogan County.....	94
Table 4.19. Okanogan County Communities.....	99
Table 4.20. City of Okanogan Fire Department Equipment List.....	144
Table 4.21. City of Omak Volunteer Fire Department Equipment List.....	145
Table 4.22. District Equipment Housed at City of Omak VFD.....	145
Table 4.23. Town of Conconully Equipment List.....	146
Table 4.24. Town of Winthrop Volunteer Fire Department Equipment List.....	148
Table 4.25. Okanogan County Fire District #1 Equipment List.....	148
Table 4.26. Fire District #2 Station #1 Equipment List.....	150
Table 4.27. Fire District #3 Station #1 Equipment List.....	151
Table 4.28. Fire District #3 Station #2 Equipment List.....	151
Table 4.29. Fire District #3 Station #3 Equipment List.....	152
Table 4.30. Fire District #4 Equipment List.....	153
Table 4.31. Fire District #6 Station #1 Equipment List.....	154
Table 4.32. Fire District #6 Station #2 Equipment List.....	154
Table 4.33. Fire District #6 Station #3 Equipment List.....	155
Table 4.34. Fire District #6 Station #4 Equipment List.....	155
Table 4.35. Okanogan County Fire District #7 Equipment List.....	156
Table 4.36. Okanogan County Fire District #9, Station #1 Equipment List.....	157
Table 4.37. Okanogan County Fire District #9, Station #2 Equipment List.....	157

Table 4.38. Okanogan County Fire District #11 Equipment List. ....	158
Table 4.39. Fire District #12 Equipment List. ....	161
Table 4.40. Fire District #13 Station #1 Equipment List. ....	167
Table 4.41. Fire District #13 East Lake Fire Station Equipment List. ....	168
Table 4.42. Fire District #14 Equipment List. ....	169
Table 4.43. Fire District #15 Station #1 Equipment List. ....	171
Table 4.44. Fire District #15 Station #2 Equipment List. ....	172
Table 4.45. Fire District #15 Station #3 Equipment List. ....	172
Table 4.46. Fire District #15 Station #4 Equipment List. ....	172
Table 4.47. Spokane District Office Equipment List. ....	181
Table 4.48. Wenatchee Field Office Equipment List. ....	181
Table 4.49. Okanogan – Wenatchee National Forest 2006 Resource List. ....	182
Table 5.1. Action Items in Safety and Policy. ....	194
Table 5.2. Action Items for People and Structures. ....	198
Table 5.3. Action Items for Infrastructure Enhancements. ....	206
Table 5.4. Action Items for Firefighting Resource and Capability Enhancements. ....	210
Table 5.5. Department of Natural Resources Recent and Planned Fuels Reduction Project in South Okanogan Distict. ....	230
Table 5.6. Tonasket Ranger District List of Proposed Projects in Okanogan County as of August 2006. ....	232
Table 5.7. Methow Valley Ranger District List of Proposed Projects in Okanogan County as of October 2006. ....	233
Table 6.1. List of Preparers. ....	238

## 6.2 List of Figures

Figure 2.1. Press Release sent on June 8 <sup>th</sup> , 2006. ....	30
Figure 2.2. Public meeting announcement for August 2006 meetings. ....	35
Figure 3.1. Total Annual Timber Harvest for Okanogan County reported by DNR, 1980-2002..	46
Figure 4.1. Wildfire Ignitions within DNR Protection Area 19720-2006. ....	77
Figure 4.2. Wildfire Ignitions within Colville Reservation 1983 - 2004. ....	79
Figure 4.3. Wildfire Ignitions recorded by U.S. Forest Service from 1910-2001.....	81
Figure 4.4. Acres burned in DNR Protection Areas 1972-2006. ....	84
Figure 4.5. Number of Ignitions by Size Class on Colville Reservation 1983-2004.....	85
Figure 4.6. Number of Ignitions by Size Class recorded by U.S. Forest Service 1910-2001.....	85
Figure 4.7. Distribution of Fire Prone Landscapes in Okanogan County by ranking scale. ....	89

## 6.3 List of Preparers

The following personnel participated in the formulation, compilation, editing, and analysis of alternatives for this assessment.

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John Foster Fanning	Okanogan County Fire District #14 Chief and Washington Department of Natural Resources	Planning committee Co-Coordinator
Gordon Hennigs	Okanogan Fire Chief's Association	Fire Chief's Association, Chair

## 6.4 *Signature Pages*

This Okanogan County Community Wildfire Protection Plan has been developed in cooperation and collaboration with the representatives of the following organizations, agencies, and individuals.

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By: Andrew Lampe Okanogan County Board of Commissioners	Date
By: Don Hover Okanogan County Board of Commissioners	Date
By: Mary Lou Peterson Okanogan County Board of Commissioners	Date
By: , Mayor City of Okanogan	Date
By: , Mayor City of Omak	Date
By: , Mayor City of Oroville	Date
By: , Mayor City of Tonasket	Date
By: , Mayor City of Brewster	Date
By: , Mayor City of Pateros	Date
By: , Mayor Town of Riverside	Date

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By: , Mayor Town of Conconully	Date
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By: , Mayor Town of Nespelem	Date
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By: , Mayor Town of Coulee Dam	Date
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By: , Mayor Town of Elmer City	Date
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By: , Mayor Town of Winthrop	Date
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By: , Mayor Town of Twisp	Date
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### **6.4.2 Signatures of Participation by Okanogan County Fire Districts and Departments**

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed.

By: Gordon Hennigs, Chief City of Okanogan Fire Department	Date
By: Kevin Bowling, Chief City of Omak Volunteer Fire Department	Date
By: Guy Layton, Chief Town of Conconully Fire Department	Date
By: Don Waller, Chief Town of Winthrop Volunteer Fire Department	Date
By: Rod Noel, Chief Okanogan County Fire District #1	Date
By: John Aumick, Chief Okanogan County Fire District #2	Date
By: Kevin Bowling, Chief Okanogan County Fire District #3	Date
By: Don Johnson, Chief Okanogan County Fire District #4	Date
By: Don Waller, Chief Okanogan County Fire District #6	Date
By: By: Brad Armstrong, Chief Okanogan County Fire District #7	Date
By: , Chief Okanogan County Fire District #8	Date



By: Tyson Woodward, Chief Okanogan County Fire District #9	Date
By: , Chief Okanogan County Fire District #10	Date
By: Phil Dart, Chief Okanogan County Fire District #11	Date
By: Mark Vine, Chief Okanogan County Fire District #12	Date
By: Tom Lindsay, Chief Okanogan County Fire District #13	Date
By: John Foster Fanning, Chief Okanogan County Fire District #14	Date
By: Mike Webster, Chief Okanogan County Fire District #15	Date
By: Jim Wheeler, Acting Coordinator Okanogan County Fire District #16	Date

### **6.4.3 Signatures of Participation by other Okanogan County Entities**

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed.

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By: Vicki Christiansen, State Forester  
Washington Department of Natural Resources

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By: James L. Boynton, Forest Supervisor  
Okanogan National Forest

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Date

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By: Raymond Fry, Superintendant  
USDI Bureau of Indian Affairs

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Date

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By:  
USDI Fish and Wildlife Service

---

Date

---

By: Dale Swedberg, Chair  
North Central Washington Prescribed Fire Council

---

Date

---

By:  
Okanogan Conservation District

---

Date

---

By:  
Okanogan County Public Utility District No. 1

---

Date

---

By: John Foster Fanning, Chair  
Highlands Fire Defense Team

---

Date

---

By: Sheron Sheldon, Executive Director  
North Cascades Chapter, American Red Cross

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Date

---

By: William E. Schlosser, Ph.D., Project Manager  
Okanogan County All Hazard Mitigation Plan, Northwest  
Management, Inc.

---

Date

## 6.5 Glossary of Terms

**Anadromous** - Fish species that hatch in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce (Salmon & Steelhead).

**Appropriate Management Response** - Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

**Biological Assessment** - Information document prepared by or under the direction of the Federal agency in compliance with U.S. Fish and Wildlife standards. The document analyzes potential effects of the proposed action on listed and proposed threatened and endangered species and proposed critical habitat that may be present in the action area.

**Backfiring** - When attack is indirect, intentionally setting fire to fuels inside the control line to contain a spreading fire. Backfiring provides a wide defense perimeter, and may be further employed to change the force of the convection column.

**Blackline** - Denotes a condition where the fireline has been established by removal of vegetation by burning.

**Burning Out** - When attack is direct, intentionally setting fire to fuels inside the control line to strengthen the line. Burning out is almost always done by the crew boss as a part of line construction; the control line is considered incomplete unless there is no fuel between the fire and the line.

**Canyon Grassland** - Ecological community in which the prevailing or characteristic plants are grasses and similar plants extending from the canyon rim to the river's edge.

**Confine** - Confinement is the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

**Contingency Plans:** Provides for the timely recognition of approaching critical fire situations and for timely decisions establishing priorities to resolve those situations.

**Control Line** - An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire.

**Crew** - An organized group of firefighters under the leadership of a crew boss or other designated official.

**Crown Fire** - A fire that advances from top to top of trees or shrubs more or less independently of the surface fire. Sometimes crown fires are classed as either running or dependent, to distinguish the degree of independence from the surface fire.

**Disturbance** - An event which affects the successional development of a plant community (examples: fire, insects, windthrow, timber harvest).

**Disturbed Grassland** - Grassland dominated by noxious weeds and other exotic species. Greater than 30% exotic cover.

**Diversity** - The relative distribution and abundance of different plant and animal communities and species within an area.

**Drainage Order** - Systematic ordering of the network of stream branches, (e.g., each non-branching channel segment is designated a first order stream, streams which only receive first order segments are termed second order streams).

**Duff** - The partially decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles, and leaves.

**Ecosystem** - An interacting system of interdependent organisms and the physical set of conditions upon which they are dependent and by which they are influenced.

**Ecosystem Stability** - The ability of the ecosystem to maintain or return to its steady state after an external interference.

**Ecotone** - The area influenced by the transition between plant communities or between successional stages or vegetative conditions within a plant community.

**Energy Release Component** - The Energy Release Component is defined as the potential available energy per square foot of flaming fire at the head of the fire and is expressed in units of BTUs per square foot.

**Equivalent Clearcut Area (ECA)** - An indicator of watershed condition, which is calculated from the total amount of crown removal that has occurred from harvesting, road building, and other activities based on the current state of vegetative recovery.

**Exotic Plant Species** - Plant species that are introduced and not native to the area.

**Fire Adapted Ecosystem** - An arrangement of populations that have made long-term genetic changes in response to the presence of fire in the environment.

**Fire Behavior** - The manner in which a fire reacts to the influences of fuel, weather, and topography.

**Fire Behavior Forecast** - Fire behavior predictions prepared for each shift by a fire behavior analysis to meet planning needs of fire overhead organization. The forecast interprets fire calculations made, describes expected fire behavior by areas of the fire, with special emphasis on personnel safety, and identifies hazards due to fire for ground and aircraft activities.

**Fire Behavior Prediction Model** - A set of mathematical equations that can be used to predict certain aspects of fire behavior when provided with an assessment of fuel and environmental conditions.

**Fire Danger** - A general term used to express an assessment of fixed and variable factors such as fire risk, fuels, weather, and topography which influence whether fires will start, spread, and do damage; also the degree of control difficulty to be expected.

**Fire Ecology** - The scientific study of fire's effects on the environment, the interrelationships of plants, and the animals that live in such habitats.

**Fire Exclusion** - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

**Fire Intensity Level** - The rate of heat release (BTU/second) per unit of fire front. Four foot flame lengths or less are generally associated with low intensity burns and four to six foot flame lengths generally correspond to "moderate" intensity fire effects. High intensity flame lengths are usually greater than eight feet and pose multiple control problems.

**Fire Prone Landscapes** - The expression of an area's propensity to burn in a wildfire based on common denominators such as plant cover type, canopy closure, aspect, slope, road density, stream density, wind patterns, position on the hillside, and other factors.

**Fireline** - A loose term for any cleared strip used in control of a fire. That portion of a control line from which flammable materials have been removed by scraping or digging down to the mineral soil.

**Fire Management** - The integration of fire protection, prescribed fire and fire ecology into land use planning, administration, decision making, and other land management activities.

**Fire Management Plan (FMP)** - A strategic plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the approved land use plan. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch, burn plans, and prevention. The fire implementation schedule that documents the fire management program in the approved forest plan alternative.

**Fire Management Unit (FMU)** - Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMU's are delineated in FMP's. These units may have dominant management objectives and preselected strategies assigned to accomplish these objectives.

**Fire Occurrence** - The number of wildland fires started in a given area over a given period of time. (Usually expressed as number per million acres.)

**Fire Prevention** - An active program in conjunction with other agencies to protect human life, prevent modification of the ecosystem by human-caused wildfires, and prevent damage to cultural resources or physical facilities. Activities directed at reducing fire occurrence, including public education, law enforcement, personal contact, and reduction of fire risks and hazards.

**Fire Regime** - The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.

**Fire Retardant** - Any substance that by chemical or physical action reduces flareability of combustibles.

**Fire Return Interval** - The number of years between two successive fires documented in a designated area.

**Fire Risk** - The potential that a wildfire will start and spread as determined by the presence and activities of causative agents.

**Fire Severity** - The effects of fire on resources displayed in terms of benefit or loss.

**Foothills Grassland** - Grass and forb co-dominated dry meadows and ridges. Principle habitat type series: bluebunch wheatgrass and Washington fescue.

**Fuel** - The materials which are burned in a fire: duff, litter, grass, dead branchwood, snags, logs, etc.

**Fuel Break** - A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

**Fuel Loading** - Amount of dead fuel present on a particular site at a given time; the percentage of it available for combustion changes with the season.

**Fuel Model** - Characterization of the different types of wildland fuels (trees, brush, grass, etc.) and their arrangement, used to predict fire behavior.

**Fuel Type** - An identifiable association of fuel elements of distinctive species; form, size, arrangement, or other characteristics, that will cause a predictable rate of fire spread or difficulty of control, under specified weather conditions.

**Fuels Management** - Manipulation or reduction of fuels to meet protection and management objectives, while preserving and enhancing environmental quality.

**Gap Analysis Program (GAP)** - Regional assessments of the conservation status of native vertebrate species and natural land cover types and to facilitate the application of this information to land management activities. This is accomplished through the following five objectives:

1. Map the land cover of the United States.
2. Map predicted distributions of vertebrate species for the U.S.
3. Document the representation of vertebrate species and land cover types in areas managed for the long-term maintenance of biodiversity.
4. Provide this information to the public and those entities charged with land use research, policy, planning, and management.
5. Build institutional cooperation in the application of this information to state and regional management activities.

**Habitat** - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

**Habitat Type** - A group of habitats that have strongly marked and readily defined similarities that when defined by its predominant or indicator species incites a general description of the area; *i.e. a ponderosa pine habitat type*.

**Heavy Fuels** - Fuels of a large diameter, such as snags, logs, and large limbwood, which ignite and are consumed more slowly than flash fuels.

**Hydrologic Unit Code** - A coding system developed by the U. S. Geological Service to identify geographic boundaries of watersheds of various sizes.

**Hydrophobic** - Resistance to wetting exhibited by some soils, also called water repellency. The phenomena may occur naturally or may be fire-induced. It may be determined by water drop penetration time, equilibrium liquid-contact angles, solid-air surface tension indices, or the characterization of dynamic wetting angles during infiltration.

**Human-Caused Fires** - Refers to fires ignited accidentally (from campfires or smoking) and by arsonists; does not include fires ignited intentionally by fire management personnel to fulfill approved, documented management objectives (prescribed fires).

**Intensity** - The rate of heat energy released during combustion per unit length of fire edge.

**Inversion** - Atmospheric condition in which temperature increases with altitude.

**Ladder Fuels** - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

**Landsat Imagery** - Land remote sensing, the collection of data which can be processed into imagery of surface features of the Earth from an unclassified satellite or satellites.

**Landscape** - All the natural features such as grasslands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

**Lethal** - Relating to or causing death; extremely harmful.

**Lethal Fires** - A descriptor of fire response and effect in forested ecosystems of high-severity or severe fire that burns through the overstory and understory. These fires typically consume large woody surface fuels and may consume the entire duff layer, essentially destroying the stand.

**Litter** - The top layer of the forest floor composed of loose debris, including dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

**Maximum Manageable Area** - The boundary beyond which fire spread is completely unacceptable.

**Metavolcanic** - Volcanic rock that has undergone changes due to pressure and temperature.

**Minimum Impact Suppression Strategy (MIST)** - “Light on the Land.” Use of minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response.

**Mitigation** - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

**Monitoring Team** - Two or more individuals sent to a fire to observe, measure, and report its behavior, its effect on resources, and its adherence to or deviation from its prescription.

**National Environmental Policy Act (NEPA)** - This act declared a national policy to encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and will stimulate the health and welfare of humankind; to enrich the understanding of important ecological systems and natural resources; and to establish a Council on Environmental Quality.

**National Fire Management Analysis System (NFMAS)** - The fire management analysis process, which provides input to forest planning and forest and regional fire program development and budgeting.

**Native** - Indigenous; living naturally within a given area.

**Natural Ignition** - A wildland fire ignited by a natural event such as lightning or volcanoes.

**Noncommercial Thinning** - Thinning by fire or mechanical methods of pre-commercial or commercial size timber, without recovering value, to meet MFP standards relating to the protection/enhancement of adjacent forest or other resource values.

**Notice of Availability** - A notice of Availability published in the Federal Register stating that an EIS has been prepared and is available for review and comment (for draft) and identifying where copies are available.

**Notice of Intent** - A Notice of Intent published in the Federal Register stating that an EIS will be prepared and considered. This notice will describe the proposed action and possible alternatives, the proposed scoping process, and the name and address of whom to contact concerning questions about the proposed action and EIS.

**Noxious Weeds** – Rapidly spreading plants that have been designated “noxious” by law which can cause a variety of major ecological impacts to both agricultural and wildlands.

**Planned Ignition** - A wildland fire ignited by management actions to meet specific objectives.

**Prescribed Fire** - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

**Prescription** - A set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

**Programmatic Biological Assessment** - Assesses the effects of the fire management programs on Federally listed species, not the individual projects that are implemented under these programs. A determination of effect on listed species is made for the programs, which is a valid assessment of the potential effects of the projects completed under these programs, if the projects are consistent with the design criteria and monitoring and reporting requirement contained in the project description and summaries.

**Reburn** - Subsequent burning of an area in which fire has previously burned but has left flareable light that ignites when burning conditions are more favorable.

**Riparian Habitat Conservation Areas (RHCA)** - Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

**Riparian Management Objectives (RMO)** - Quantifiable measures of stream and streamside conditions that define good fish habitat and serve as indicators against which attainment or progress toward attainment of goals will be measured.

**Road Density** - The volume of roads in a given area (mile/square mile).

**Scoping** - Identifying at an early stage the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental analysis accordingly.

**Seral** - Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition.

**Serotinous** - Storage of coniferous seeds in closed cones in the canopy of the tree. Serotinous cones of lodgepole pine do not open until subjected to temperatures of 113 to 122 degrees Fahrenheit causing the melting of the resin bond that seals the cone scales.

**Stand Replacing Fire** - A fire that kills most or all of a stand.

**Sub-basin** - A drainage area of approximately 800,000 to 1,000,000 acres, equivalent to a 4th - field Hydrologic Unit Code.

**Surface Fire** - Fire which moves through duff, litter, woody dead and down, and standing shrubs, as opposed to a crown fire.

**Watershed** - The region draining into a river, river system, or body of water.

**Wetline** - Denotes a condition where the fireline has been established by wetting down the vegetation.

**Wildland Fire** - Any non-structure fire, other than prescribed fire, that occurs in the wildland.

**Wildland Fire Implementation Plan (WFIP)** - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will have two-three stages of the WFIP completed while some fires that receive a suppression response may only have a portion of Stage I completed).



**Wildland Fire Situation Analysis (WFSA)** - A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

**Wildland Fire Use** - The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", which is a broader term encompassing more than just wildland fires.

**Wildland Fire Use for Resource Benefit (WFURB)** - A wildland fire ignited by a natural process (lightning), under specific conditions, relating to an acceptable range of fire behavior and managed to achieve specific resource objectives.

**Wildland Urban Interface (WUI)** – The wildland urban interface as defined by this planning committee is located in Section 4.5. In general the definition of WUI is the area where structures and other human development meet or intermingle with undeveloped wildland.

## **6.6 Literature Cited**

- Agee, J.K. 1993. Fire ecology of the Pacific Northwest forests. Washington: Island Press.
- Agee, J.K. 1998. The Landscape Ecology of Western Forest Fire Regimes. Northwest Science, Vol. 72, Special Issue 1998.
- Anderson, H. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service, Intermountain Forest and Range Experiment Station. INT-GTR-122. 22 pp.
- Barrett, J.W. 1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 106 p.
- Brown, J.K. 1995. Fire regimes and their relevance to ecosystem management. Pages 171-178 *In* Proceedings of Society of American Foresters National Convention, Sept. 18-22, 1994, Anchorage, AK. Society of American Foresters, Wash. DC.
- Beukema, S.J., D.C. Greenough, C.E. Robinson, W.A. Kurtz, E.D. Reinhardt, N.L. Crookston, J.K. Brown, C.C. Hardy, and A.R. Stage. 1997. An Introduction to the Fire and Fuels Extension to FVS. In: Teck, R., Moeur, and Adams. Proceedings of the Forest Vegetation Simulator Conference, 1997 February 3-7, Fort Collins, Co. Gen. Tech. Rep. INT-373. Ogden UT: USDA Forest Service, Intermountain Research Station.
- Dillman, D.A. 1978. Mail and Telephone Surveys: The Total Design Method. Hoboken: John Wiley & Sons, Incorporated. 344 p.
- Everett, R., R. Schellhaas, T. Anderson, J. Lehmkuhl, and A. Camp. 1996. Restoration of Ecosystems Integrity and Land Use Allocation Objectives in Altered Watersheds - Watershed Restoration Management. Physical, Chemical, and Biological Considerations. American Water Resources Association. July 1996. 270 p.
- Fiedler, Carl E., Charles E. Keegan III, Chris W. Woodall, Todd A. Morgan, Steve H. Robertson, John T. Chmelik. 2001. A STRATEGIC ASSESSMENT OF FIRE HAZARD IN MONTANA. Report submitted to the Joint Fire Sciences Program, September 29, 2001. Pp. 39.
- Final Environmental Impact Statement North-Kennedy Cottonwood stewardship Project Emmett Ranger District, Boise National Forest March 2003.
- General Accountability Office. Technology Assessment – “Protecting Structures and Improving Communications during Wildland Fires”. GAO-05-380. April 2005.
- Graham, W.G. and L.J. Campbell. 1995. Groundwater Resources of Washington. Washington Department of Water Resources, Boise, ID. GIS Data.
- Golder Associates. Pend Oreille (WRIA 62) Watershed Management Plan. Washington Department of Ecology. May 2005.
- Hammond, C.; Hall, D.; Miller, S.; Swetik, P. 1992. Level 1 stability analysis (LISA) documentation for version 2.0 USDA, Forest Service. General Technical Report INT-285. Intermountain Research Station, Ogden, UT.
- Hann, W.J., Bunnell, D.L. 2001. Fire and land management planning and implementation across multiple scales. *Int. J. Wildland Fire*. 10:389-403.
- Hardy, C.C., Schmidt, K.M., Menakis, J.M., Samson, N.R. 2001. Spatial data for national fire planning and fuel management. *International Journal of Wildland Fire* 10:353-372.

- Harris, C., P.S. Cook, and J. O’Laughlin. 2003. Forest Resource-Based Economic Development in Washington: Analysis of Concepts, Resource Management Policies, and Community Effects. Policy Analysis Group, University of Washington, College of Natural Resources, Report № 22. Pp 82.
- Holsapple, L.J., Snell, K. 1996. Wildfire and prescribed fire scenarios in the Columbia River Basin: relationship to particulate matter and visibility. In: Keane, R.E., Jones, J.L., Riley, L.S., Hann, W.J., tech. eds. Compilation of administrative reports: multi-scale landscape dynamics in the Basin and portions of the Klamath and Great basins. On file with: U. S. Department of Agriculture, Forest Service, Department of Interior, Bureau of Land Management; Interior Columbia Basin Ecosystem Management Project, 112 E. Poplar, Walla Walla, WA 99362.
- Homer, C.G. 1998. Washington/western Wyoming landcover classification report and metadata. Department of Geography and Earth Resources. Utah State University. Logan, UT 84322-9635. [chomer@gis.usu.edu](mailto:chomer@gis.usu.edu)
- Huff, M.H., Ottmar, R.D., Alvarado, E., et al. 1995. Historical and current forest landscapes in eastern Oregon and Washington. Part II: Linking vegetation characteristics to potential fire behavior and related smoke production. Gen. Tech. Rep. PNW-GTR-355. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43p. (Everett, Richard L., team leader; Eastside forest health assessment; Hessburg, Paul F., science team leader and tech. ed., Volume III: assessment.)
- IDEQ (Washington Department of Environmental Quality). 2003. Rules of the Department of Environmental Quality, IDAPA 58.01.02, “Water Quality Standards and Wastewater Treatment Requirements”. Washington Administrative Code (3-20-97), IDAPA 58.01.02, Boise, ID.
- Johnson, C.G.; Clausnitzer, R.R.; Mehringer, P.J.; Oliver, C.D. 1994. Biotic and Abiotic Processes of Eastside Ecosystems: the Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.
- Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.
- Jones, J. 2003. Fire Risk Modeling GIS data for Washington. USDA Forest Service, Flathead National Forest. Kalispel, Montana.
- Levinson, D.H. 2002. Montana/Washington Airshed Group; Operating Guide. Montana / Washington Airshed Group, Missoula, MT 59808
- Louks, B. 2001. Air Quality PM 10 Air Quality Monitoring Point Source Emissions; Point site locations of DEQ/EPA Air monitoring locations with Monitoring type and Pollutant. Washington Department of Environmental Quality. Feb. 2001. As GIS Data set. Boise, Id.
- McCoy, L., K. Close, J. Dunchrack, S. Husari, and B. Jackson. 2001. May 6 –24, 2001. Cerro Grande Fire Behavior Narrative.
- MacDonald, L. H.; Smart, A.W.; and Wissmar, R.C. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. USEPA Region 10 Report No. 910/9-91-001.
- Mill Creek Watershed Assessment Emmett Ranger Districts, Boise National Forest May 2003

- National Interagency Fire Center. 2003. Information posted on the Agency's Internet web site at <http://www.nifc.gov/>
- National Register of Historic Places. 2003. Internet web site listings for Okanogan County, Washington. On the Internet at [www.nationalregisterofhistoricalplaces.com](http://www.nationalregisterofhistoricalplaces.com)
- Norton, P. 2002. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment, June 20, 2002. Fish and Wildlife Service, Bear Valley National Wildlife Refuge.
- Ottmar, Roger D.; Alvarado, E.; Hessburg, P.F.; [and others]. 1996. Historical and current forest and range landscapes in the interior Columbia River basin and portions of the Klamath and Great basins. Part III: Linking vegetation patterns to potential smoke production and fire behavior. Draft report. On file with: U.S. Department of Agriculture, Forest Service; U.S. Department of Interior, Bureau of Land Management; Interior Columbia Basin Ecosystem Management project, 112 E. Poplar, Walla Walla, WA.
- Quigley, T. and S. Arbelbide (Tech. Editors). 1997. An assessment of Ecosystem Components in the Interior Columbia Basin. Pacific Northwest Research Station, Walla Walla, WA. GTR-405. pp. 372, 460, 462, 480-486, 855-869.
- Quigley, T.M., R.A. Gravenmier, R.T. Graham, tech. eds. 2001. Interior Columbia Basin Ecosystem Management Project: project data. Station Misc. Portland, OR. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Redmond, R.L. 1997. Mapping existing vegetation and land cover across western Montana and Northern Washington. Wildlife Spatial Analysis Lab. Montana Cooperative Fish and Wildlife Research Unit. University of Montana, Missoula, MT 59812.
- Schlosser, W.E., V.P. Corrao, D. Thomas. 2002. Shoshone County Wildland Urban Interface Fire Mitigation Plan, Final Report. Northwest Management, Inc., Moscow, ID.
- Schmidt, K.M., Menakis, J.P. Hardy, C.C., Hann, W.J., Bunnell, D.L. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. General Technical Report, RMRS-GTR-87, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.
- Scott, H.S. 1998. Fuel reduction in residential and scenic forests: a comparison of three treatments in western Montana ponderosa pine stand. Res. Pap. RMRS-RP-5. Ogden, UT. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 19 p.
- Steele, R.; Arno, S.F.; and Geier-Hayes, K. 1986. Wildfire patterns change in Central Washington's ponderosa pine-Douglas-fir forest.
- Swanson, F.J. 1978. Fire and geomorphic processes; in Fire Regimes and Ecosystem Properties. USDA Forest Service Gen. Tech. Rep. WO. 26 pp.
- Thompson, R.A., P.H. Skabelund, N.C. Kulesza, E.N. Dean. 1973. Soil - Hydrologic Reconnaissance. New Meadows Ranger District, Payette National Forest. 242 pp.
- U.S. Census Bureau. 2000 population data. American FactFinder. Available online at [www.census.gov](http://www.census.gov). Last accessed August 2006.
- USDA. 1999. Salmon River Canyon Project Draft Environmental Statement. USDA Forest Service. Nez Perce National Forest.

- USDA-Forest Service (United States Department of Agriculture, Forest Service). 2000. Incorporating Air Quality Effects of Wildland Fire Management into Forest Plan Revisions – A Desk Guide. April 2000. - Draft
- USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: <http://www.fs.fed.us/r3/sfe/fire/urbanint.html>
- Vogl, R.J. 1979. Some basic principles of grassland fire management. Environmental Management 3(1):51-57, 1979.
- Washington State Department of Natural Resources. Washington Forest Health Issues in 2005. Web page. Date accessed July 13, 2006. Available at: <http://www.dnr.wa.gov/htdocs/rp/forhealth/2005highlights/index.html> .
- Wright, H.A. and A.W. Bailey. 1980. Fire ecology and prescribed burning in the Great Plains – A research review. United States Department of Agriculture, Forest Service, Intermountain Forest Range Experiment Station, Ogden, Utah. General Technical Report. INT-77.
- Wright, H. A. and Bailey, A.W. 1982. Fire ecology: United States and Southern Canada. John Wiley and Sons, Inc. 501 pp.

This plan was developed by Northwest Management, Inc., under contract with the Okanogan County Commissioners with funding provided by the Washington Department of Natural Resources and Okanogan County through a National Fire Plan grant.

**Citation of this work:**

Schlosser, W. E., T. R. King, and V. Bloch. *Lead Authors*. 2006. Okanogan County, Washington, All Hazard Mitigation Plan – Volume I. Northwest Management, Inc., Moscow, Idaho. December 13, 2006. Pp. 223.

Schlosser, W. E., T. R. King, and V. Bloch. *Lead Authors*. 2006. Okanogan County, Washington, Community Wildfire Protection Plan – Volume II. Northwest Management, Inc., Moscow, Idaho. December 13, 2006. Pp 255.

Schlosser, W. E., T. R. King, and V. Bloch. *Lead Authors*. 2006. Okanogan County, Washington, All Hazard Mitigation Plan Appendices – Volume III. Northwest Management, Inc., Moscow, Idaho. December 13, 2006. Pp. 70.

Schlosser, W.E. and T.R. King. *Lead Authors*. 2006. Okanogan County, Washington, Terrorism and Civil Unrest Mitigation Plan – Volume IV. Northwest Management, Inc., Moscow, Idaho. December 13, 2006. Pp 37.

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Last Page of Document



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